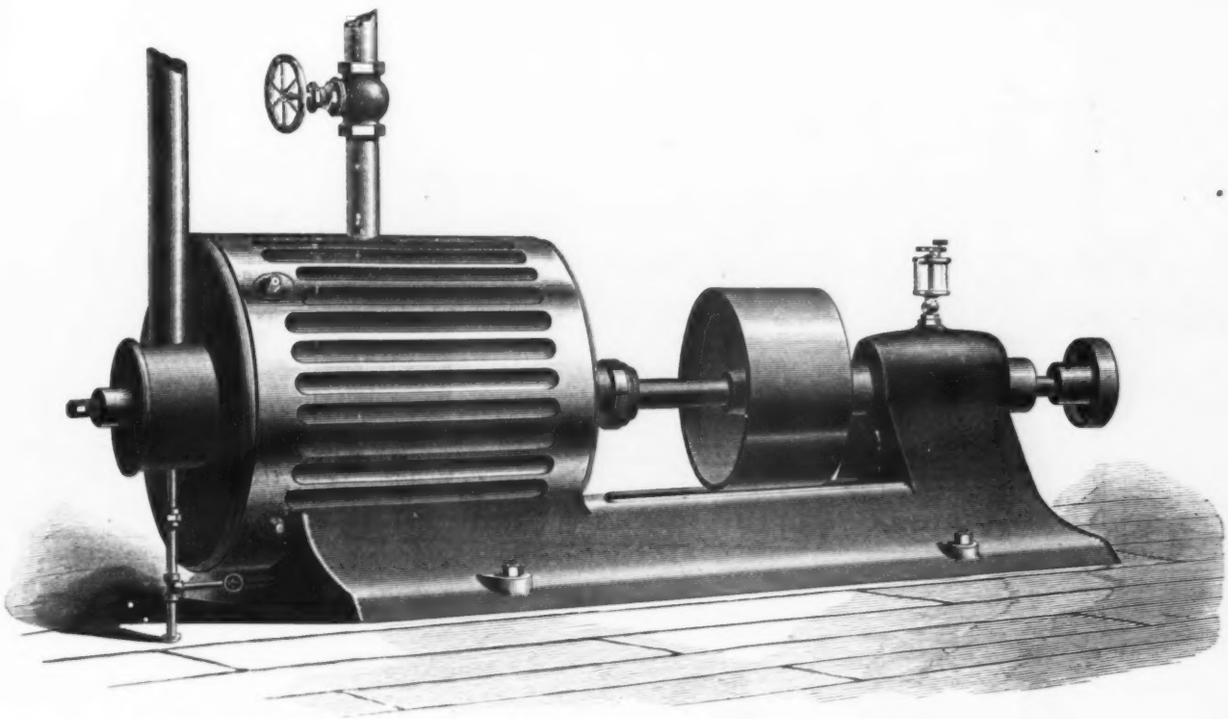
THE IRON AGE

THURSDAY MARCH 3, 1892.

The American High-Speed Engine

It is a difficult matter to properly and comprehensively name, in one term, the engine of which we here present engravings and which is the invention of Elmer S. Smith, and is built by the American Engine Company of Bound Brook, N. J. It is neither a rotary nor a reciprocating engine, nor does it resemble the so-called Colt's disk engine. The designer appears to have discovered a new construction possessing several marked advantages. The engine takes steam and exhausts four times at each revolution, and yet the motion of its parts is such that there are no dead centers. It has an automatically variable cut-off and can be governed so as to run easily at any speed desired up to or more than 1000 revolutions per minute. The piston, or wabbling spherical segment, which corresponds to the piston in the ordinary engine, is perfectly balanced, as is also the crank, so that there is no vibration and the engine runs smoothly and noiselessly. The engine, with its governor, is wholly self-contained, all the parts being in one case. All the moving parts, with the exception of the outer shaft bearing, are lubricated with steam.



THE AMERICAN HIGH-SPEED ENGINE.

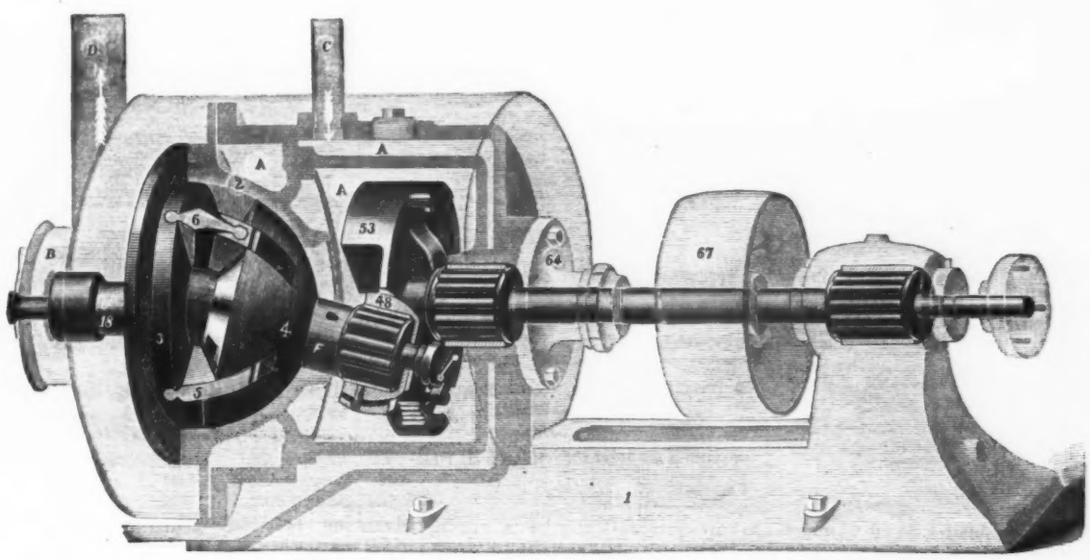


Fig. 2.—Interior View—Working Parts in Full Lines, Outer Parts in Phantom.

Its Construction.

Perhaps it may be best to first name the parts of the engine, reference being had to Fig. 2: 1 is the bed plate; 2 the cylinder; 3, cylinder head; 18, follower pin; 5 and 6, partition blades; 53, crank disk; 48, spherical bushing; 64, stuffing box; 67, pulley; A, steam chest; B, exhaust chest; C, live steam pipe, and D, exhaust pipe. The cylinder is bolted to the bed and projects into the steam chest, which gives it a live-steam jacket. Radiation from the

steam chest is prevented by a cast iron jacket surrounding it. The piston is a segment of a sphere, and fits into the cylinder, which is concaved to receive it. The cylinder is formed with a circular opening, through which projects a stem, F, located centrally on the piston. This opening admits steam from the steam chest to the back of the piston, and this area is so proportioned as to balance the pressure of steam in the compartments acting on the face of the piston. Excessive friction between the piston and cylinder surfaces is thus prevented.

The follower pin is made hollow and connects the exhaust chest in the cylinder head with the valve chamber which passes centrally through the piston. It also furnishes an abutment for packing strips in the end of the partition blades. The opposite ends of the blades are also provided with packing strips, which prevent leakage of steam past them from one compartment to another. The sides of these blades are made radial from the center of motion, which allows for the taking up of any wear between them and their bearings against the piston. All such wear is taken up automatically by a spring advancing the blades toward the follower pin. These blades have a pivot connection with the cylinder head, which allows them to swing to accommodate the movements of the piston.

The crank disk, 53, and shaft is supported in two frictionless roller bearings, as shown in Figs. 2 and 3. These bearings are made interchangeable, and the construction is such as will insure the greatest durability. The bed-plate casting is bored out where the shaft passes through it and bushed with steel, and these steel bushings incase the roller bearings. Steel sleeves also surround the shaft to form its journals, or bearings. All the parts are hardened and then ground perfectly true. The bearing in the crank-disk for the crank pin or piston stem is of the same construction.

The thrust collars on the outboard bearing are for the purpose of holding the shaft from moving endwise and keeping it in the proper position on the bearings.

The Valves.

There are two valves, a main and a cut-off valve, shown in Figs. 6, 7, 8 and 9. The main valve is located in the center of the piston and extends from the follower pin, together with its stem, to the back of the crank disk, and describes a circle with the piston stem and crank disk about the axis of the shaft, the radius of the circle decreasing toward the follower pin. The valve also turns on its own axis, being rigidly connected to the spherical bushing 48, which is connected to the crank disk by a screw, as shown. This valve controls the admission of steam to the steam chambers, or compartments; also the opening and closing of the exhaust.

The cut-off valve is located inside the main valve, and controls the time of closing the steam port. Its stem extends through the main valve stem to the back of the crank disk, where it connects, by

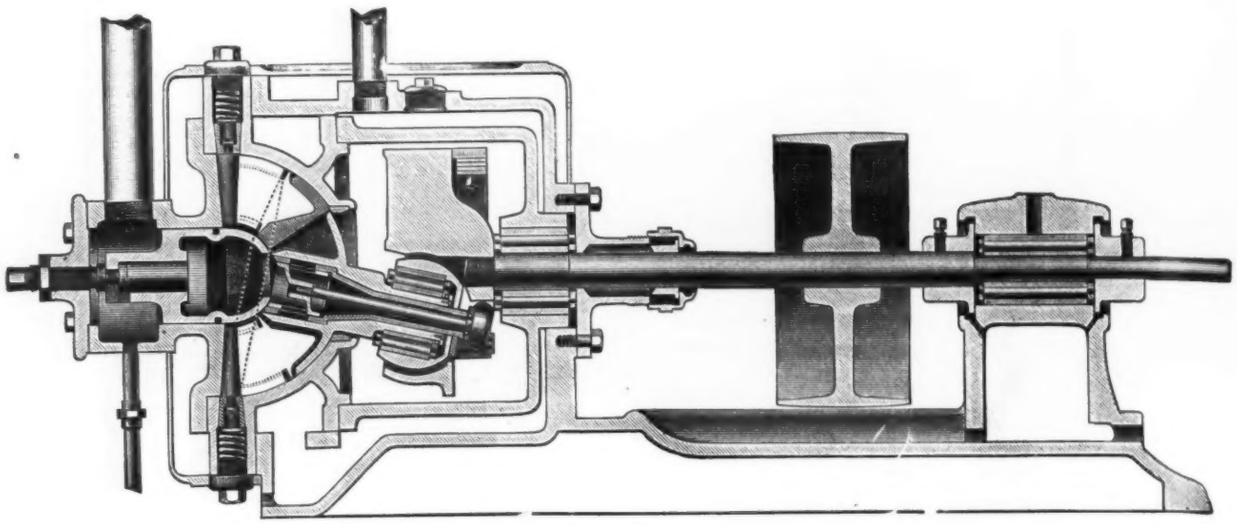


Fig. 3.—Vertical Section Parallel with Shaft.

Fig. 4.

Fig. 5.

The Partition Blades.

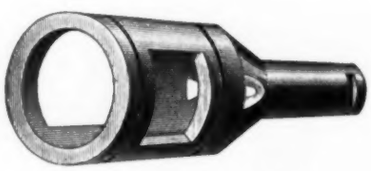


Fig. 6.—Main Valve.

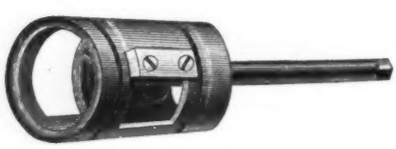


Fig. 7.—Cut-Off Valve.

Fig. 8.—Cut-Off Valve in Position in the Main Valve.

THE AMERICAN HIGH-SPEED ENGINE.

The partition blades 5 and 6, which are shown attached in Figs. 4 and 5, and two similar blades diametrically opposite, divide the space between the piston and cylinder head into four compartments. The follower pin, 18, the inner end of which is spherically shaped, fits into a cavity in the piston, and is for the purpose of furnishing a bearing to the piston. It may be advanced by the adjustment screw at its opposite end to take up wear between it and the piston, and between the surface of the piston and that of the cylinder. Such adjustment, however, is hardly necessary, because of the perfect balance maintained by the steam acting on the face and back of the piston.

means of steel rods, directly with the governor weights, which have pivotal connection with the disk.

The valves are cylindrical in shape, and, as stated, are located in the center of the piston, which is bored out to receive them. These valves, as before explained, turn upon their own axes, making one revolution of the shaft, while the piston is stationary upon its own axis. The ports, or steam passages, extend from the valve bore, in the piston, to its face; these ports are uncovered for the passage of steam, and exhaust, as the valves turn upon their own axes in the piston. The main valve has a portion cut out on two sides; one is for the admission of live steam, from the inside of the cut-off valve, to the cylindrical face of this rib is flush. The front edge of this rib performs the function of cutting off the steam, thereby regulating communication between the steam chest and the steam chambers, through the ports. The steam port is fully open when the segment, or rib, rests against the rear edge of the steam port of the main valve. The position of the segment, or rib, in the main valve is varied by turning the cut-off valve within the main valve. Its position, as shown in Fig. 8, represents the port in the main valve partly closed; by turning the cut-off valve sufficiently, the port will be entirely closed, in which position no steam can pass through the valve, communication between the steam chest and between bearings, to transmit a whole or a part of the power; or, if desired, it may be located outside the outboard bearing; or both pulleys may be used; or direct connection may be made to the end of a shaft by means of a coupling.

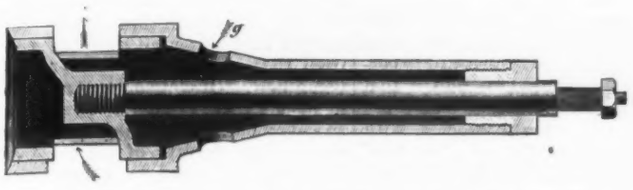


Fig. 9.—Section through Main and Cut-Off Valves.

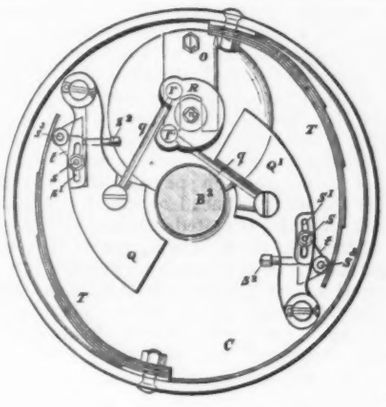


Fig. 10.—The Governor.

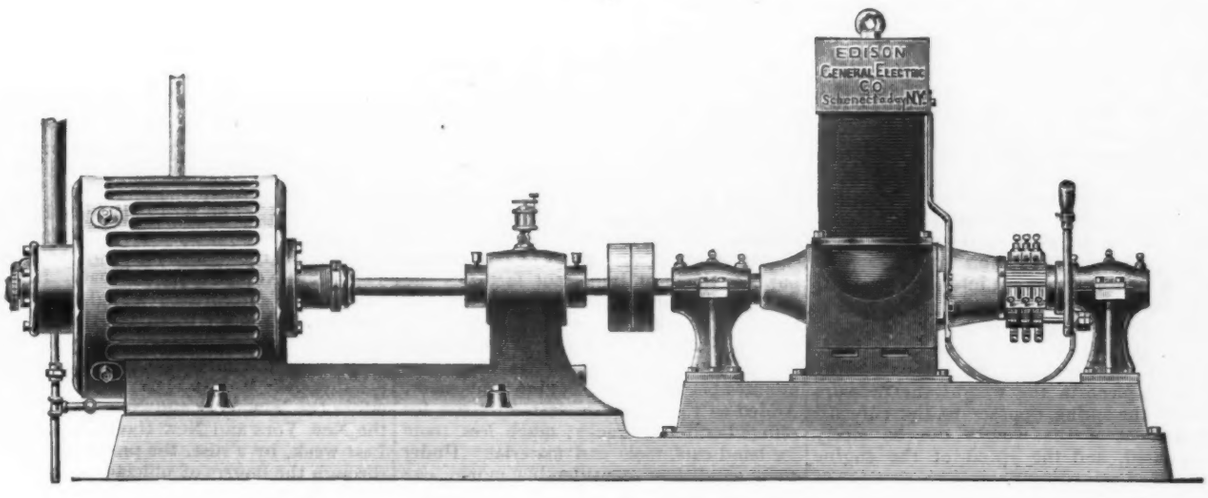


Fig. 11.

AMERICAN HIGH-SPEED ENGINE COUPLED DIRECTLY TO DYNAMO.

Operation of the Engine.

We will now follow the steam in its passage through the engine, reference being had to Fig. 2, and note the effect.

Steam enters the chest A through the pipe C. From the steam chest it passes through the holes seen in the piston stem F to the inside of the cut-off valve. Thence through a passage in the piston to one of the steam chambers or compartments between the piston 4 and cylinder

steam chambers, and the other is for the passage of exhaust steam from those chambers to the inside of the cut-off valve—the live and exhaust steam being separated by a partition in the cut-off valve, as shown in Fig. 9. Steam is admitted to the inside of the main valve through the aperture *g*, and passes to the inside of the cut-off valve, and thence through the port to one of the steam chambers, its course being indicated by the darts. The lower of the three darts indicates the course of the exhaust steam as it escapes from one of the steam chambers. The segment, or rib, fastened to the periphery of the cut-off valve by means of two screws, as shown in Fig. 7, forms the rear or trailing edge of the steam-inlet port of the cut-off valve. It projects outwardly into the steam-inlet port of the main valve, with which latter the steam chambers being entirely cut off. The cut-off valve stem being connected with the governor weights, as they move they turn the valve and change the position of the cut-off segment in the main valve port, thereby varying the time of closing the ports in the piston as the valves revolve. The opening in the opposite side of the main valve, which covers and uncovers the ports in the piston on the exhaust side, remain open constantly, so that the exhaust is invariable.

The stuffing box 64, Fig. 2, is to prevent the leakage of steam from steam chest along the crankshaft.

The spherical-shaped steel bushing 48 is seated in the crank disk, to receive the crank bearing. It is free to accommodate itself to the angle of the piston stem with the crank shaft.

The pulley may be located on the shaft, head 3, where it forces the piston away from cylinder head.

The stem of the piston is prevented from moving in a direct line with the action of the steam by its connection to the crank disk 53, and is compelled to describe a circle with the axis of the shaft for its center.

Steam continues to flow into this compartment until communication is cut off by the cut-off valve, after which it continues to force the piston away from the cylinder head by expansion, until the stroke is completed; or, in other words, until the face of the piston has reached the limit of movement away from cylinder head allowed by the piston stem, as it is guided in a circle around the axis of the shaft. The port through which steam had been admitted to this compartment is now put

into communication, by the main valve, with the exhaust passage through the follower pin, 18, and passes out the pipe D. In the manner described, steam is admitted to one compartment or steam chamber after another, completing the revolution of the shaft; the time of closing the port for admission of steam being controlled by the governor, automatically, so as to maintain a uniform speed under varying loads and varying steam pressure. The main valve also opens communication with one compartment or steam chamber after another, and controls the admission and exhaust, which remains constant or invariable.

The Governor

is inclosed in the steam chest. It consists of two weights—Q Q^1, Fig. 10—pivoted to the rear side of the crank disk on diametrically opposite sides of the engine shaft and connected with the stem of the cut-off valve by steel rods *q q* and a carrier plate R. The latter is secured to the projecting end of the cut-off valve stem and is provided with two ears, *r r*, each having on its inner side a spherical socket in which the spherical head of one of the steel rods, or links, is seated, the opposite spherical heads of the rods being seated in spherical sockets in the governor weights. The spherical connection of the rods with the weights and carrier plate permits the parts to move freely, although arranged at an angle to each other. The flat tapered springs TT resist the outward movements of the weights. These springs are secured to the rim of the crank disk, and their free ends bear against adjustable bearing pieces or rollers, *t t*, secured to the outer sides of the weights. Each of the rollers is attached to the weight by a pivot bolt, S, which is arranged parallel with the pivot of the weight, and which passes through an approximately radial slot, S^1, in the weight, so that the bearing piece can be adjusted toward and from the fulcrum of the weight by shifting the pivot bolt in this slot. Each bearing piece is arranged in a recess in the outer side of the weight, and can be adjusted on its pivot bolt toward and from the spring by a set screw, S^2, which is screwed into the weight, and bears against the rear side of the bearing piece; the latter is provided at its apex with a roller, S^3, by which it bears against the spring. By adjusting the bearing piece in the weight the pressure which the spring opposes to the outward movement of the weight can be nicely regulated, and the speed of the engine governed accordingly.

The weights have a knife-edge bearing against their supporting studs, which reduces the friction to the minimum and increases the sensitiveness of the governor.

What little lubrication is required is supplied through the steam, and therefore, as long as the engine is running the governor is lubricated, without any special devices or personal attention. Therefore, long runs may be made without stopping to oil the governor. In all high-speed machinery and so-called high-speed engines all bearing surfaces must have a constant supply of oil, as it is worked out of the bearings quickly and thrown off. This not only wastes the oil, but necessitates guards to protect attendants, floors and walls. These are more or less unsightly and cause some expense. These objections are avoided in this engine, and besides, the governor is also thoroughly protected from dust and dirt.

When required, the engine is provided with a simple reversing mechanism.

General.

The last engraving, Fig. 11, shows the engine coupled directly to a dynamo, for which service its high speed and close regulation peculiarly adapt it. On account of its extreme lightness and form, which is such as to require but little room and places the center of gravity very low, it can be used with advantage on boats. In short, it is applicable wherever high speed is needed.

Steel Ties and 100-Pound Rails.

The *Railroad Gazette* deals editorially with the interesting fact that the New York Central and Hudson River Railroad will put down 100-pound rails on steel ties on the four tracks from Grand Central Station yard to Mott Haven junction. Two miles of this distance is in tunnel and 2½ miles in open cutting with retaining walls, or on viaduct. At first thought one would say that a tunnel was about the last place to get the economy of metal ties, because corrosion would reduce their life much below the normal. The life of a wooden tie would not be shortened in a tunnel nearly in the same ratio that the life of a metal tie would be reduced. With regard to corrosion, however, it should be added that the steel ties now being laid there are treated by the Angus Smith process, with coal pitch varnish and linseed oil at 300° F. One of the ties so treated was taken out of the track at Garrison's, after having been down 2½ years, and showed no indication of rust or corrosion.

But the New York Central case is a special one. The four tracks from the Grand Central Station to Mott Haven carry the concentrated traffic of two great railroads into and out of the third city of the world. Over these tracks there are about 500 train and engine movements a day. With such a traffic the determining element in the life of a tie is its capacity to resist wear rather than its endurance against decay. On the New York Division of the Pennsylvania, for example, where an intense traffic is borne by oak ties in stone ballast, a rotten tie must seldom be taken out of the track. It is worn out before it has time to rot. The New York Central case is a similar one with further complications. It is probable that the ruling element there is not one of tie economy; but that the most important factor is the cost and difficulty of doing work on the track. There are, as we have said, about 500 movements a day through this narrow throat, or, on the average, less than three minutes between each engine movement. Added to this, there is scarcely room for refuge beside the tracks; much less, room for hand-cars, tools and material. Under such conditions considerable money can be spent profitably merely to keep workmen off the track. With 100 pound rails, on steel ties, in stone ballast, thoroughly drained, it may be expected that the work of surfacing, lining and renewals will be reduced to the minimum that can be reached in present practice. The work of the trackmen ought to be reduced to watching the fastenings and looking for broken rails. It was found that in the year 1891 the cost of labor in maintenance on the experimental section of 100 steel ties put down in January, 1890, was but 3¼ cents per tie.

Considering, then, the difficulties of working in the narrow limits of a tunnel, in the dark, and with incessant traffic, it is decided to reconstruct the track so as to make it really permanent way. This work is now going on at night, between 9.15 p.m. and 6 a.m. The old ballast is excavated and the sub-grade lowered 3 inches to allow for the higher rail and give a little more head room. The new sub-grade is sloped to drain into three 10-inch pipes, which discharge by silt basins, trapped into the city sewers. On the road bed so prepared 12 inches of broken stone ballast is laid. In this the steel ties are bedded, carrying the 100-pound rails, 6 inches high. The fastenings are by ⅞-inch bolts and clip washers 3 inches broad.

The economic results cannot be determined for some years, but probably the theory will be justified by the practice. If it is there are other places about New York where the same course will, perhaps, be taken for the same reasons. For instance, the Bergen tunnel of the Erie is about 4388 feet long, double tracked. Through this tunnel are carried the passenger and freight trains of the main line, including a heavy suburban business, and the trains of four other roads with a large suburban traffic. Just west of the tunnel are the principal roundhouse and an important freight yard of the Eastern terminus of the Erie, so that through the tunnel there is a considerable movement of light engines and empty cars, added to the heavy traffic movement. Altogether from 325 to 350 engines go through the tunnel every day. It is not surprising that between wear and corrosion the life of a rail is less than three years. Nothing heavier than 74-pound rails has yet been tried there, but an 80 pound rail is now being laid. Of course maintenance is difficult and costly, and a matter of constant anxiety; but we remember of no accident there from defects of track. Certainly none has happened in recent years, but they have only been avoided by incessant care and expense. This, then, is another situation in which the most costly track may be the cheapest. Why would it not be a good plan to lay 100-pound rails through the tunnel, with steel ties one-half its length and oak ties and tie plates the other half?

New Freight Arrangements in New England.

Important changes in traffic arrangements by rail in the Eastern States result from the transfer from one corporation to another of the short line road, built some years ago from Waterbury and Meriden to tidewater on the Connecticut River, with the design of rectifying alleged exorbitant charges on freight by the New York and New Haven Railroad. H. C. Wilcox, the enterprising manufacturer, of Meriden, advanced most of the money. As an independent corporation it was practically worthless financially, but its position gave it a strategic importance for either the New York and New England or the New York and New Haven to control. Last week, by a ruse, the property slipped through the fingers of officials in the New Haven Railroad into the possession of the New York and New England. President Bostwick of the last mentioned corporation says: "By securing this road the New York and New England now has a straight line from Danbury, Conn., to the Connecticut River. We already own a line running from Boston to Willimantic, 88 miles, double tracked most of the way. By building a link from Willimantic to the eastern terminal of this little railway only 18 miles in length, we command absolutely the shortest and most direct route from Boston to Danbury, and there our connections and traffic alliances bring us into commanding position. I will not say that we are going to build this link, but it is my impression that we are."

The New York and New England is believed to be in sympathy with the Reading in its new combination.

The Baltimore and Ohio Railroad has issued a new rate sheet on iron and steel commodities from the Pittsburgh and Wheeling districts to points in Western Pennsylvania and Ohio. It is interesting to note that it includes rates on tin-plate bars.

Blast Furnace Slags.—II.

Their Calculation by Graphic Methods.

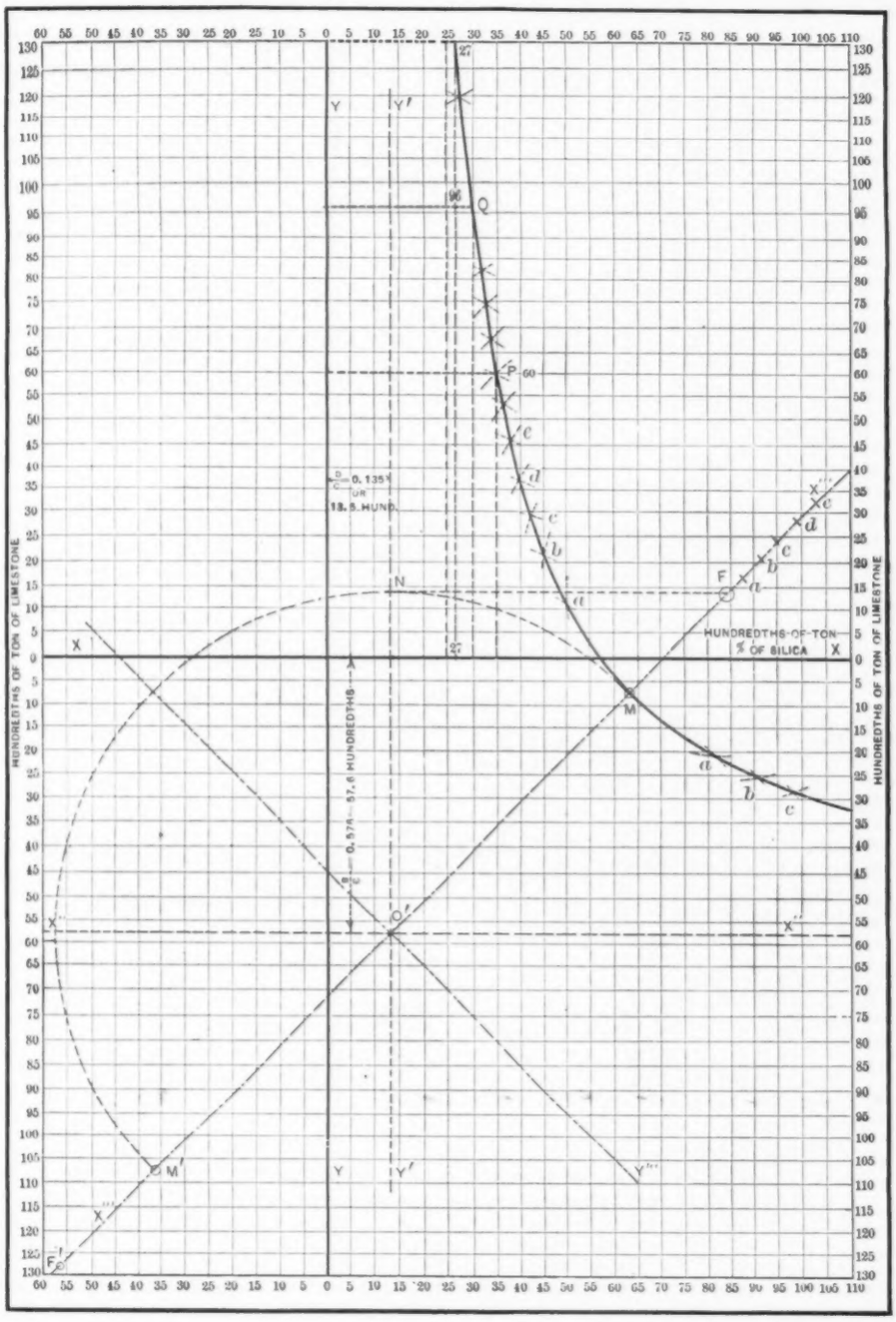
BY A. J. ROSSI, NEW YORK.

(*Continued from page* 343, *February* 25.)

Another problem suggests itself: The ores, fuel and stone remaining constant in composition, it may be interesting to study graphically the effect that changes in the percentages of silica assumed in the slag will have on the quantities of stone required; in other words, given the analyses of certain materials, to find at once graphically the amount of stone corresponding to different percentages of silica assumed *à priori* in the slag. The preceeding equations furnish us all the elements of such a construction. We will deal briefly first with the considerations which lead to the construction, and will then describe practically how they can be carried out.

Returning to the original equation $y = \frac{A - Bm}{Cm - D}$ and calling x the percentage m of silica now considered as being variable, the materials which have furnished the quantities A, B, C, D remaining the same, we have $y = \frac{A - Bx}{Cx - D}$ which gives $Cxy - Dy + Bx - A = 0$, an equation which represents an hyperbolic curve.

Let X X, Y Y, be two lines at right angles representing what is called the axis of co ordinates. By carrying below X X the quantity $OM = \frac{B}{C}$ and to the right of Y Y, $ON = \frac{D}{C}$, at a proper scale (as will be explained below), and drawing X' X', Y' Y' parallel to X X and Y Y, it would be easy to show analytically that these two lines X'' X'', Y' Y', intersecting each other at O', represent the asymptotes of the curve—that is, two lines toward which the curve comes nearer and nearer without ever intersecting or touching them. If, through O, we draw the two lines X''' X''', Y''' Y''' making an angle of 45° with X'' X'', Y' Y', we obtain the axis of the curve. If from O' we carry on X''' X''' to M' $= \sqrt{\frac{2CAC - BD}{C}}$ we obtain at once the vertical M and its symmetrical M'. Drawing the circle with O' as center and O' M' as radius it intersects Y' Y' at N and the horizontal line passing through N it intersects X''' X''' at F, the focus of the hyperbola; taking O' F' = O' F, we have at once the other focus F'—that is, all the elements to construct the curve, once for all, for given materials without any more calculations. The curve once constructed, if from O, on X X, we lay divisions, proceeding by $\frac{1}{100}$ and representing percentages of silica, dividing in the same manner the vertical O Y, the vertical lines corresponding to the points of division of O X intersect the curve at different points, which represent the corresponding quantity of limestone, easily read on the scale at O Y in hundredths of a ton.



For instance, suppose that we read from O on O X, 35 per cent. silica (0.35), the amount of silica assumed *à priori* as desired in the slag, then the vertical O P, read on the scale O Y, will represent the corresponding quantity of limestone in hundredths of a ton required with 1 ton of the ore and $\frac{3}{4}$ ton of the fuel considered for an assumption of 35 per cent. of silica in the slag.

Having thus explained briefly the mathematical considerations which lead to the

constructions, we will describe in full the graphic method, all technicalities discarded, illustrating it in an example, taking, for instance, the "first ore," fuel and stone already mentioned, of which the composition was:

Ore 1 Ton.

Silica	15.00	a
Alumina	3.50	11.50. Sum of bases b.
Lime	3.00	
Magnesia	4.00	
Alkalies	1.00	

Fuel ¾ Ton.

Containing in hundredths of tons as explained above.

Silica	4.50	a'
All bases	3.00	b'

Stone.

Silica	8.00	a''
Lime	48.50	51. b'' Sum of bases.
Magnesia	2.50	

Taking a sheet of profile paper divided to the millimeter, and assuming each division or millimeter to represent 1 per cent. of silica, one hundreth of silica in the slag, draw the two lines Y Y, X X, and number them as in diagram, carrying the divisions below X X closer yet if desired.

In the example chosen we have:

$a + a' = A$ = sum of silica in ore and fuel = 19.50

$a + a' + b + b = B$ = sum of all the constituents of ore and fuel = 19.50 + 11.50 + 3 00, or = 34.00.

$a'' + b'' = C$ = sum of all the constituents of stone = 8 + 51 = 59.

$a'' = D$ = silica of stone = 8.

1°. Divide the sum of the constituents of ore and fuel (B) by the sum of all the constituents of stone (C); that is, in this example, 34 by 19.50, the quotient is 0.576, or 57.6 hundredths, which we can read very approximately below X X from O, drawing at that distance 57.6, X″ X″, parallel to X X.

2°. Divide the silica of the stone (D) by the sum of all the constituents of the stone (C); in this case, 8 by 59, we find 0.135, or 13.5 hundredths. Read to the right of O Y from O 13.50 and draw Y′ Y′ parallel to Y Y; we obtain at once O′.

3°. Draw at O′ the two lines at 45°. O′ X‴, O′ Y‴. We then must find the point M. To do this:

4°. Multiply 19.50 by 59 (A by C), it gives 1150.5; subtract from this the product of 8 by 34 (D by B), or 272, the remainder is 878.5; double it, we have 1757, of which the square root taken from any table of roots is 41.91.

Divide 41.91, the root obtained, by 59 (C) (the sum of all the constituents of stone); the quotient, 0.71, = 71 hundredths, carried from O′ and measured at the scale of O X and O Y gives the point M and its symmetrical M′ at once; the points F, F′, the foci, are easily obtained by drawing from O′ with O M = O M′ the circumference O M M′, which cuts Y′ Y′ at N. Following on diagram the horizontal line which passes by N or drawing it we have F, and of course F′, since O′ F = O′ F′; the curve can then be readily constructed by points or by continuous motion of a pencil like an ellipse.

To construct it by points mark at random on X‴ X‴ certain points a, b, c, d, e, f, &c., beyond F, as many as desired. From F, with a radius successively equal to M a, M b, M c, M d, M e, M f, &c., draw arcs of circle (above and below X X). From F′, with radius successively equal to M′ a, M′ b, M′ c, M′ d, M′ e, M′ f, &c., draw other arcs of circle, which intersect the first ones at the points a, b, c, d, e, f, &c., which are points of the curve. As many of these points can be determined as will, by choosing them close enough, allow of an easy construction of the curve by joining by hand the points thus determined by a continuous curve line. The curve when rawn gives at once the amount of limestone required for different percentages of silica assu ned *à priori* in the slag for the given stone, fuel and ores.

For instance, using the preceding materials (first ore), suppose that we assume 35 per cent. of silica in the slag. Reading 35 per cent. of silica $\frac{35}{100}$ of silica on the divided line X X, the vertical line passing by this point 35 intersects the curve at P and the vertical line (35–P) represents the amount of stone required. It reads on the diagram, on the divided scale O Y, 60, that is, $\frac{60}{100} = 0.60$ ton of limestone, exactly the figure we have found already by direct calculation and by the first diagram. To assume 1 millimeter for 1 per cent. of silica is sufficiently exact; were a greater accuracy required 2 millimeters could be taken to represent 1 per cent. Each division of the paper would read then exactly ½ of $\frac{1}{100}$, and ¼ of $\frac{1}{100}$, or half the space beween two lines of the paper, could be readily estimated.

Beside dividing the lines O X, O Y as explained, it will prove very convenient to draw the same scale on a separate narrow strip of the same profile paper and use this strip to measure the different distances, instead of and besides reading them specially for measuring the ordinates or vertical lines, such as 35–P.

The curve intersects the line X X at a point which reads very nearly $\frac{57}{100}$. At this point the vertical line, which would give the limestone, is zero, is reduced to a point; that is to say, that with the preceding ores, fuel and stone, it would be impossible to obtain a slag containing more than 57 per cent. of silica, a result already found by another mode of reasoning. In fact, the point 57 corresponds to the limit at which the materials—ores and fuel—would be self fluxing, and consequently would not require the addition of any limestone. The line Y Y not touching the curve, and its distance from O being 13.50, it shows that it would be also impossible to obtain with such materials a slag containing less than 13½ per cent. of silica, another limit obtained also precedently in another manner. Though 13.50 per cent. of silica is theoretically the lower limit, an inspection of the diagram shows at once that even a practical limit of 25 per cent. silica would require an enormous amount of limestone, the vertical line passing by this point 25, read on O X, not intersecting the curve on the diagram, which is scaled to $\frac{130}{100}$, or 1.30 tons of lime. In other words, to obtain 25 per cent. only of silica in the slag it would be necessary to add much more than 1.30 tons of stone for every ton of ore and ¾ ton of fuel—that is, much over 2.60 tons of stone per ton of pig, calling the ores 50 per cent rich, and reckoning the figures as 100 of iron. The vertical line 27–27, corresponding to 27 per cent. silica, would correspond about to this amount of limestone. To obtain even 30 per cent. of silica in the slag, following the vertical line passing by 30 silica to its intersection with the curve at Q, we read readily on OY, 96, that is, $\frac{96}{100}$ of stone per ton of ore (the exact calculation would give 0.959). Hence per ton of pig in the same conditions as above, to obtain a slag containing 30 per cent. silica nearly 2 tons of stone would be required, so that really the economical limits of silica for such materials would be comprised between 30 and 57 per cent. silica in the slag. The preceding considerations show how useful such diagrams can be for certain examinations. In conclusion, we will recall to mind that all these constructions would apply exactly as well as already insisted upon had all the base elements of the different materials been transformed into lime for the reasons explained at length previously. It would be sufficient in this case wherever the term "basic elements" appears to understand by it the number representing their equivalence as lime.

A Joliet Jollification.

The Business Men's Association of Joliet, Ill., according to their annual custom, gave a banquet on the 17th of February. A number of speeches were made by participants in the festivities, some by State celebrities with a reputation as *post prandial* orators, but the addresses which were the special feature of the evening were delivered by two practical men, William Garrett, the rod mill inventor, and John Lambert, the barb wire manufacturer. Following is the address of

William Garrett.

Joliet has already gained an enviable position as a maunfacturing town, which, to a great extent, is due to her extraordinary shipping facilities, her excellent foundation, and an abundance of stone for building purposes; not only enough for her own requirements, but immense quantities are daily shipped abroad. Her natural surroundings are beautiful, with what was once a fine river flowing in her midst.

On the west side there is elevated ground, with beautiful and comfortable homes, and on the east, south and north are plains suitable in every way for manufacturing purposes, and accessible in all directions to her network of railways.

Joliet is almost the birthplace of the barb fence industry, and with the exception of De Kalb I believe is actually so. She has produced the best barb-wire machine in the world, and to-day these machines can be found in England, France, Germany and other European countries.

Joliet can produce more barb wire than any other city or town in the world. Wire mills have sprung up in our midst; factories which started in a very small way—so small that I might compare them to the parable of the mustard seed, which is the smallest of all seeds—but these factories have grown in keeping with the parable to such an extent that the birds of the air seek a resting place, which is abundantly found in its thousands of miles in extent and inclosing the cattle, if not on a thousand hills, at least on a thousand plains.

In the near future Joliet will use more rods and make more wire than any other single city or town in the world, excepting, perhaps, Cleveland, Ohio. We have three wire-mill plants, which when completed will compare favorably with any in this country for the purposes required of them. We have in our midst the largest individual wire-rod consumer in this country, and when this is admitted it means the world. We have a steel works of which we may feel justly proud.

In 1889, when the consolidation of the South Chicago, Union Steel Works and the Joliet Works took place, there naturally was a feeling of disquietude among the people of Joliet as to whether this move was to their interests, seeing that the facilities at South Chicago for making pig iron, which is the basis of Bessemer steel, were much better than at Joliet, and it was feared that when dull times came Joliet would be the first place to shut down. Since then we have passed through two of the dullest years we have had for a long time, but the Joliet Works have had the lion's share of the business. This is not due in any way to partiality, but to certain advantages.

We may say that the rolling of steel rails in Joliet is a thing of the past, and that being so, if enough of business can be obtained for the class of work for which the Joliet plant is at present adapted, namely, a grade of soft steel suitable for making all kinds of wire, merchant steel, hoops, sheets, tin plate and a miscellaneous class of work, which always requires more

labor than the making of one particular thing, and as the method of making steel rails is almost perfectly automatic there is nothing in the steel trade that requires less men per ton of product than in the manufacture of rails, so we can say we have gained by the change, but the past and present gain is as a drop in the bucket compared to the great gain we will derive in the future.

At our last annual meeting we had the pleasure of listening to our Chauncey Depew of Joliet. I mean ex-Mayor Paige. He, in glowing terms and in eloquent tones, which only come from a natural born orator, gave a few pages by way of description of the future of Joliet. The north, the south, the east and west parts of the town had so spread that if I recollect aright, St. Louis, Milwaukee, Chicago and Cincinnati had all become suburbs of Joliet. But, after all, gentlemen, there was a great deal of truth in what Mr. Paige said, and the steel works of Joliet I believe will be the main factor in bringing about this end, for I do not know of a place on this continent where there is a more favorable opportunity to embark in the manufacture of tin plate, sheets, steel hoops and merchant steel bars than is presented by Joliet to day. We have the raw material at our feet and are located between all competitors and the markets of the West and Southwest.

Permit me to show you briefly the amount of business in the steel trade, which rightly belongs to this vicinity.

It is estimated that there are about 120,000 tons of iron and steel shipped to and through Chicago every year. We will assume that 50,000 tons of this is soft steel in the shape of merchant steel bars. Over 20,000 tons of tin plate was used in Chicago last year; 10,000 tons of sheets. About 12,000 tons of hoops are used within a radius of Joliet that would give her such advantages in freight as to shut out all Eastern competitors. In fact, thousands of tons of steel have been shipped to Pittsburgh and Youngstown, and shipped right past us to Peoria and St. Louis.

The situation would then be :

50,000 tons merchant steel bars, valued at	$1,600,000
20,000 tons tin plates, valued at	1,500,000
12,000 tons steel hoops, valued at	540,000
10,000 tons sheets, valued at	500,000
92,000	$4,140,000

The above is a fair estimate in quantity and a very conservative estimate in value. Thus we find a new business, amounting to over $4,000,000 annually, and all the raw material for over the 92,000 tons a year can be found right at home, and the market right at your door.

But what are the special inducements that the steel works here can give you?

The works at Joliet are devoted entirely to the manufacture of steel suitable for wire rods, merchant steel, sheets, hoops and tin plate, and to give you an idea of the improved state of manufacture, will say by way of comparison that were you to go at sunrise and see the molten metal come out of the blast furnace and follow it through the various stages you would see it in the shape of barb wire or wire nails in kegs, ready to ship, by sundown. I may add in connection with this that not in the whole world can such a state of things be found to exist—sunrise in molten metal, which if run into molds and cooled, would be called pig iron; sundown in a finished state, such as wire nails and barbed fence—and the same could be said in reference to sheets, hoops and merchant steel.

I mention this to show the extraordinary facility there is in Joliet for making the above grades of steel and manufactured articles.

What will be the outcome of this condition of things?

The time is not far distant when the towns in the West will grow up into cities, and villages into towns, and while not very many years ago, within the recollection of many present here to night, all iron industries (there were no Bessemer steel plants at that time) of this country were located east of the Allegheny Mountains. Then Pittsburgh became and is still the iron and steel center of this country, but the West is fast gaining on her and the time is not far distant when Illinois will be the leading manufacturing State, especially in iron and steel, for, notwithstanding the extraordinary facilities for transporting freight, which in cost per ton per mile is less than in free trade countries—countries which boast that free trade makes everything cheap, competition has become so great on the one hand, and the increase in demand on the other, that the West will find means to manufacture the goods she uses at her own door.

The starting up of the Superior Steel Works, in Wisconsin, a few weeks ago, for the manufacture of steel plates, is another "handwriting on the wall," that the day of supremacy of the East in the manufacture of iron and steel is getting less and less every day.

The question now is, what part will Joliet take in bringing this about, seeing that "she floats in the cream of opportunity?"

Allow me to tell you what she has done in the wire business. Before the close of 1892 you will have three wire mills capable of turning out 500 tons of wire per day, or in a year, counting 250 days, 125,000 tons. If this is made into barbed wire it would be more than two-thirds of all the barbed wire used last year. If it was made into wire nails, it would equal 2,500,000 kegs, more than two-thirds of the wire nails used in this country last year. Just think of it—Joliet, a little Western town of about 30,000 inhabitants, able to produce two-thirds of all the barbed fence or two-thirds of all the wire nails a country of over 66,000,000 population can use. Truly, so far as the wire industry is concerned, we can say to those connected with it: "Well done, good and faithful servants," you have added materially to the building up of the town.

Before the close of this year we will see a sheet mill in successful operation, and our tin-plate mill turning out tin plate equal to any in this or any other country, and once the ice is broken in this direction I venture to predict that tin-plate mills and hoop mills will spring up all around us; and as corporations do not generally purchase large tracts of land adjoining their present manufacturing sites to grow roses or geraniums, we can fairly assume that the tract of land south of the present site of the steel works will not be used as a flower garden, but before many years will be covered with machinery that will give employment to thousands of men, and if opportunities in this direction are availed of there is no reason why Joliet in the year 1900 should not have fully 60,000 inhabitants.

One of the penalties of the "fall" was that "by the sweat of thy brow shalt thou earn thy bread." That mandate has been strictly adhered to in all the past ages, and in fact the actual state of affairs is even worse than the sentence, for there are thousands of men in this country which boasts of its prosperity who have not the opportunity to sweat and earn their daily bread, and as the Scottish bard truly says,

"See yonder poor one, labored wight,
So abject, mean and vile;
Who begs a brother of the earth
To give him leave to toil."

While the foundation of all sources of wealth is derived from tilling the soil, yet manufacturing industries go hand in hand with the farmers, giving them a home market for their produce, who in turn give a home market to the products of the factory, which clothe and supply the comforts of life; supply means for transportation for grain and for cattle across continents and oceans to feed the hungry in foreign lands. Show me a man that opens up an avenue whereby he can give his fellow men an opportunity to earn their daily bread and I will show you a benefactor of the human race.

Many men have died after accumulating millions, which they, in a measure, locked up while living, and when dead having endowed or left their money to erect churches, in the vain hope that it was a premium against fire in the next world. Give me the man who uses the wealth that God has given him while he lives, and uses the money not in indiscriminate charity, but in enterprise and such business as will find employment for his fellow men, and to my mind a model type of such a man exists in Andrew Carnegie of Pittsburgh, who is at the head of the most successful organization in this country, and who is continually branching and extending his business and giving employment to thousands of men, instead of hoarding his money and investing it in bonds, as many do, then die and leave their wealth to be fought over by their nearest and dearest relatives in the courts. Andrew Carnegie's name will be remembered long after he is dead, more for the good he has done his fellow men, through his enterprise in business than if he had simply given the money to endow libraries, &c.

I will conclude by quoting the words of Daniel Webster, from a speech given in the United States Senate, July 7, 1846.

"And, sir, take this great truth; place it on the title page of every book of political economy intended for the use of the United States; put in every farmers' almanac; let it be the heading of the column of every mechanic's magazine; proclaim it everywhere, where there is work for the hands of men there will be work for their teeth. Where there is employment there will be bread. It is a great blessing to the poor to have cheap food, but greater than that, prior to that and of still higher value, is the blessing of being able to buy food by honest and respectable employment, which gives health, sobriety and morals. Constant employment and well-paid labor produce, in a country like ours, general prosperity, content and cheerfulness."

After Mr. Garrett's address the chairman called on

John Lambert.

to state the product of the Lambert Wire Mill for twenty-four hours. That gentleman responded in an address second in interest to none made during the evening. He opened by saying there was no man in America to-day to whom the farmer owes a greater debt of gratitude than William Garrett. In 1865 there was no mill in the country producing more steel rods than 10 tons per day. That was a little affair at Newark, N. J., which later moved to Johnstown, Pa., and the owners seemed to think wonders had been accomplished when 15 tons of rods were made in a day.

"This brings me," he said, "to the subject of taxation, already alluded to to-night, and I cannot refrain from making a few remarks on that head. Several years ago it cost the farmer more to fence 80 acres of land than the land itself was worth. Then Mr. Glidden of De Kalb got the idea of a barb wire fence, which he made by twisting a pointed strip around a ribbon of sheet iron. Our own pioneers, H. B. Scutt and William Watkins, also got the idea, and a few manufacturers with small capital asked Congress to put a

small tax on wire rods, in order to give this country a chance to compete with Europeans, who were charging $80 a ton. The tax was put on and then American genius got in its work. Garrett, then working for a wire concern at Cleveland, conceived improved methods of making rods, resulting in what is known as the Garrett mill, which in 1878 produced 70 tons of steel rods in a day, while to-day the Garrett mill in Joliet produces 250 tons a day of better rods than ever were made before, while but $34 a ton is charged, as against the $80 that formerly went across the ocean. Could a better proof be asked that taxation does not increase the price of product? Give us protection in our industries and American genius will see that prices come down, not up. We do not forget labor, for our American labor is receiving as much as four times what it receives abroad in similar lines, and we want to feel that this government is run for the American people and their material prosperity.

"In 1891 three and a half million kegs of wire nails were made in the United States. This year there will be about five million. The business is increasing at a rate which will make it one of the most important we have, and I think the time is not far distant when more wire rods and more wire product will be manufactured at Joliet than in any other five cities of America, and our mill alone in 1892 will use 350 tons of rods a day.

"As to Chairman Vance's question, I will say that we started in yesterday to see what we could do, and in twenty-four hours we drew 284 tons of wire, while the foreman told me to tell Garrett if that wasn't enough he could make it 300 tons."

The Kennedy Universal Mill.

Julian Kennedy, the well-known engineer, of Pittsburgh, has designed for an Eastern mill a universal mill, the principal features of which are intended to secure improvements in the construction of the upright rolls of such a mill. His aim has been to provide means for the rapid removal of the rolls, the setting of the guide bars in such a manner that they can be removed laterally, and power and compactness of the mill. The accompanying drawings show the principal features of the vertical rolls. It will be observed that there are two working rolls, A, and two driving rolls, A', Fig. 1, geared together by gears, K, attached to the rolls below the upper guide bars. Mr. Kennedy has thus departed from the practice of driving the working rolls by frictional contact, to avoid slipping

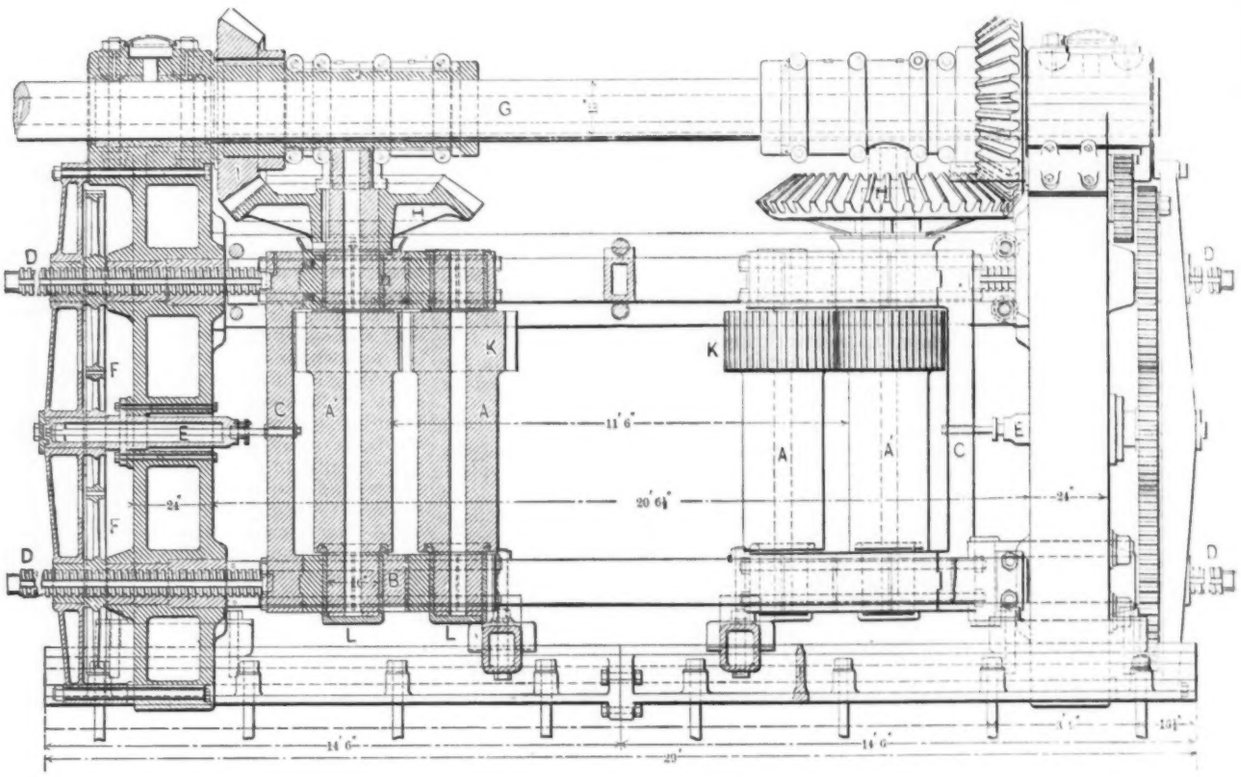


Fig. 1.—Vertical Section.

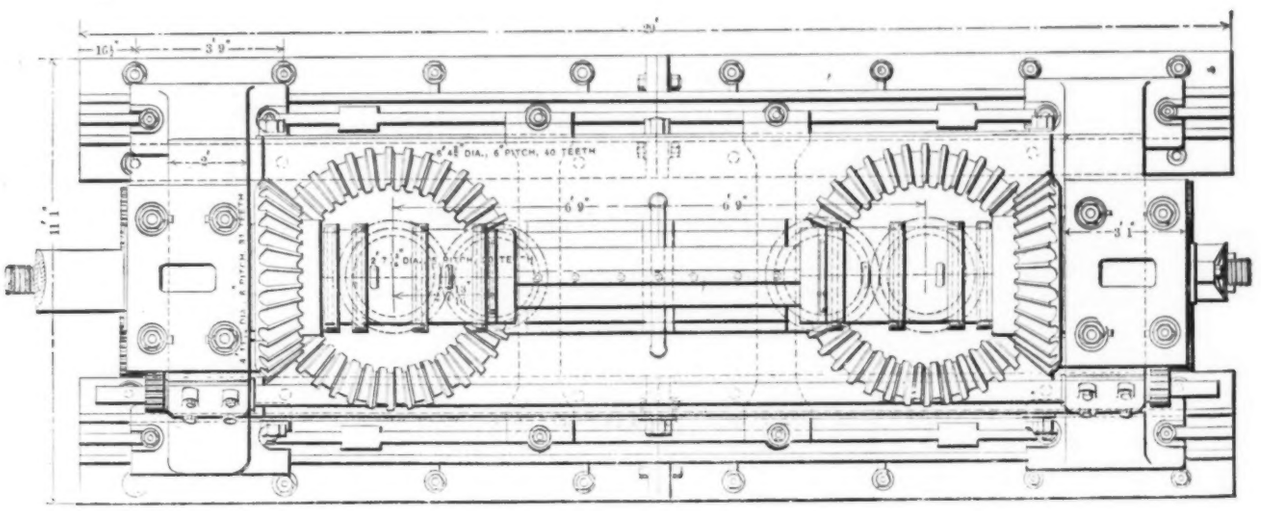


Fig. 2.—Plan.

THE KENNEDY UNIVERSAL ROLLING MILL.

and any tendency on the part of opposite working rolls to act with lack of uniformity. The reason for using two pairs of rolls is that with a single pair the driving bevel gears would prevent the rolls being brought sufficiently close together to roll metal of small dimensions unless these gear wheels are made of unduly small diameter, or the rolls themselves were made of unduly large diameter.

If it is desired to use the mill for working wide pieces, the inner rolls can be readily removed and the outer rolls can be employed as the working rolls. The bearing box B, Figs. 1 and 3, is made in vertically divided sections, which are fitted around the roll journals between the guide bars, and have flanges which fit on the guide bars and support the bearings. The adjacent bearing sections are securely bolted together by bolts, which also secure them to the respective ends of an upright carrier or frame, C, Fig. 1, and this likewise fits between and is supported by the guide bars. The lateral adjustment of the carrier and the consequent adjustment of the rolls carried thereby is obtained by means of adjusting screws D, Fig. 1, which pass through nuts in the housings and bear upon the carriers. The counterbalancing cylinders E, also shown in Fig. 1, have their pistons connected with the carrier C, and by hydraulic pressure constantly exercised withdraw the carriers.

G, Fig. 1, is the main driving shaft. The lower guide bars *a*, Fig. 3, rest upon seats, *b*, formed on the inner opposite sides of the housings, and are held together by bolts, *c*, extending transversely through the bars, while the outer ends extend through the housings and are held by nuts. The two lower guide bars are connected at their ends by bolts, *b*. The upper guide bars *f*, which are hollow longitudinally, are supported on shoulders on the inner sides of the housings, and are firmly held by long bolts, *h*. The construction of the rolls and the lower guide bar allows of the simple removal of the driving rolls by disengaging the bearing section, freeing one of the lower guide bars, removing it laterally, taking away the upper guide bar and carrying off the roll. The inner rolls can be removed by disconnecting the bearing sections at B, Fig. 1, and dropping the rolls through a window or enlarged space formed at the middle of the lower guide bars. J, Fig. 1, is a sectional collar, which encircles the driving shaft G loosely, and which has a bearing socket, in which the end of the neck of the driving roll is fitted. As the rolls are adjusted laterally with their carriers through the mechanism of D and E, the neck of each driving roll, acting on the collar, moves the hub along the driving shaft, and maintains the latter in constant power connection with the roll.

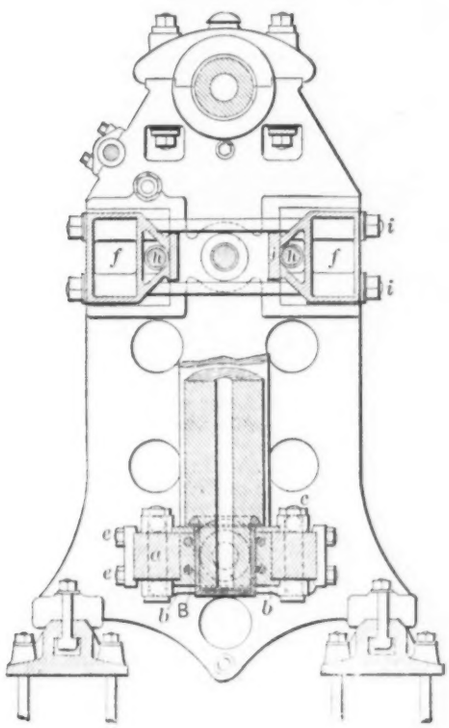


Fig. 3.—Vertical Section.

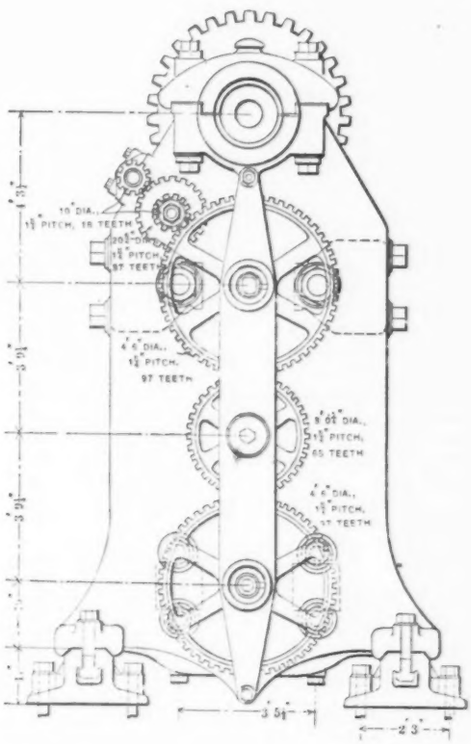


Fig. 4.—Side Elevation.

THE KENNEDY UNIVERSAL ROLLING MILL.

The contracts for the iron work for the new Buffalo Furnace of the Union Iron Works were awarded last Tuesday. A number of bidders were present from Buffalo, Oswego, Syracuse, Pittsburgh and other places. The contract for the iron work of the 18 x 80 foot furnace complete, including three 18 x 70 foot Whitwell-Cowper Kennedy stoves and an iron draft stack 10 feet in diameter, 140 feet high, was awarded to Riter & Conley of Pittsburgh, Pa. The contract for building and erecting the boiler plant complete, consisting of 14 steel boilers, was awarded to Farrar & Treffts of Buffalo, N. Y. The three blast engines which formerly ran the three Union furnaces at Buffalo will be utilized for the new furnace. A large condensing engine will be erected, as it is intended to run the blast engines low pressure. F. B. Baird is general manager.

The directors of the South Tenth Street Bridge Company, operating a bridge from Pittsburgh to the South Side, have decided to replace the present wooden structure with a new iron bridge. The new structure will be of the modern suspension pattern, and will cost about $400,000. It will have four tracks, two for street cars and two for wagon traffic, and two foot ways. The contract for the erection of the bridge will be let in a short time.

Excitement at Duluth.

Since the great real estate boom in 1886, Duluth has not seen such an interested and eager crowd of investors or speculators as are now dealing in iron stocks A press dispatch from that city dated February 24, says:

All day to-day the entrance and sidewalk of the Chamber of Commerce Building were turned into a mining exchange, and to-night the crowd has transferred itself to the lobby of the Spalding Hotel, which is black with people. It is all on account of the news from the new Mesaba iron range, which continues to show increased prospects as a great ore center. Within the past week stocks in the half-dozen companies which have put stock on the market have been advancing at a rapid rate. A week ago the Biwabik Mine stock was at 30. It jumped to 50 by Monday morning. The Cincinnati, which has shown up over 3,000,000 tons of ore by 14 test pits, sold at 15 last week, went to 18 Saturday night, to 22 Monday, and 25 yesterday, and to-day was at 26. The Charleston was put on the market this morning at 10 and soon went up to 12. The Chicago went from 15 to 18, the Great Northern from 11 to 14, and the Shaw from 14 to 17.

The Car-Axle Manufacturers' Association of the West held a meeting last Wednesday at the Grand Pacific Hotel, Chicago. They reported a satisfactory condition of business in their special line, as the demand for axles has been greatly increased of late by the large purchases of railroad equipment. It is stated that no attempt was made by the association to fix a scale of prices.

WORLD'S FAIR NOTES.

The Congressional Visit.

Chicago gave a truly royal reception to the members of Congress and other distinguished visitors accompanying them, who arrived in the city on February 20. There were four special train loads, in all 300 people, including about 100 Congressmen. They made the journey from Washington to Chicago via the Baltimore and Ohio Railroad. The finest cars had been provided for the party, and every pains was taken to secure the utmost measure of comfort for the excursionists. A committee of citizens received them in Chicago and escorted them to their hotels. Their first evening, that of Saturday, was spent at a reception given in their favor by Mr. and Mrs. Potter Palmer. Sunday was not covered by any formal programme. On Monday morning the visitors were taken to Jackson Park by special train on the Illinois Central Railroad, and were shown what had been accomplished thus far by way of preparation for the fair. Every visitor expressed astonishment at the magnitude of the undertaking as shown by the work already completed. Luncheon was served at the club house of the Washington Park Driving Club, not far from the exposition grounds. In the evening a banquet was given by the Commercial Club at the Grand Pacific Hotel. On Tuesday morning, the 23d, the visitors left the city for the return trip to Washington over the Pennsylvania Railroad, and in due time arrived at their destination without any mishap. The excursion was a serious undertaking, but it was well handled, and the visitors were loud in their praises of the admirable manner in which their wishes were even anticipated. The assertion has been frequently made that members of Congress needed to be educated upon the importance of the World's Fair. Many of them admitted as much, after they had seen the grounds and the immense buildings now rapidly approaching completion. Perhaps every visitor to Chicago on this occasion can be safely put down from this time as an enthusiastic believer in the World's Fair project.

Universal Satisfaction.

The wording of the President's special message on the World's Fair created universal satisfaction on both sides of the house at fair headquarters, and a disposition was shown to let all past differences go by the board in a united effort to accomplish something which shall be as satisfactory to the law makers as the message is to the fair people.

The consequence is that another effort will be made by the committees of the directory and the commission to outline a plan of procedure that will cover the demands and necessities of both sides. The local Committee on Federal Legislation will meet as soon as possible and decide what shall be done, and, if possible, arrange their claims in a manner that will not conflict with the inclinations and desires of the National Commission.

"The message of the President," said President Baker, "is satisfactory to me and must impress all fair officials most favorably. I shall call a meeting of our committee as soon as it is convenient and we will try to arrange our matters so that they may be joined with those of the commission in one bill. We will then all work together for the passage of the bill drafted. It is much better that the two bodies work together, but whether one bill or two are introduced we will work together and for each other. I shall go to Washington in a few days, but do not know whether any one else will decide to go."

Director General Davis said:

"The message of President Harrison is just what I had expected. It is a clear, concise statement, and Congress will be very deeply impressed with the importance of its text. It is a wonderful thing for the fair, and shows that the executive head of this nation fully and deeply realizes the magnitude of this great enterprise."

Secretary Dickinson of the National Commission said:

"The message is written in President Harrison's usual felicitous style, and exhibits not only a comprehensive appreciation of the national importance of the enterprise, but a thorough knowledge of the details and methods of its administration, which must have resulted from a careful personal investigation of the data before him. His recommendation will fully justify Congress in taking appropriate action in behalf of the exposition, which will meet the approval of all the States and territories in the Union."

The British Royal Commission.

The Royal Commission of Great Britain has appointed a number of committees covering the different departments of art, education, history, manufactures, colonies, &c. The members of these committees are every one of them men of unquestioned reputation and proved ability. A few of them may be noticed specially.

The Chairman of the Fine Arts Committee is Sir Frederick Leighton, Bart., president of the Royal Academy. He is the official head of British art.

The Chairman of the Colonies' Committee is Sir Saul Samuel, K.C.M.G., C.B., agent general for New South Wales.

The Chairman of the India Committee is Major General Sir Owen Tudor Burne, K.C.S.I., C.I.E., a member of the Indian Council, and a man of great prominence in the government of England's vast possessions in the Eastern world.

The Chairman of the Committee of Agriculture and Food Products is the Earl of Feversham, president of the Royal Agricultural Society of Great Britain, the most important and influential association of its kind in the world.

The Chairman of the Committee of Mines and Metallurgy is Sir Isaac Lowthian Bell, Bart., who was chairman of the mining jury at the Centennial Exposition.

The celebrated Prof. W. C. Roberts-Austin, C.B., F.R.S., and Clement Le Neve Foster, D.Sc., are also active members of the Mining Committee.

The chairman of the Committee of Engineering, Architecture, &c., is Sir Frederick Bramwell, Bart., D.C.L., F.R.S., M. Inst. C. E. Sir Frederick is one of the most noted men in England, and was for a long time president of the Institution of Civil Engineers.

The chairman of the Committee of Electricity is William Henry Preece, F.R.S., electrician to the post office of England. He is well known in the electrical world and is working hard to make the display in his especial department a notable one.

The chairman of the Committee of Transportation is Sir Douglas Galton, K.C.B., D.C.L., F.R.S. This gentleman is not unknown in the United States. He was a juror of transportation awards at the Centennial Exposition.

Sir Henry Doulton is chairman of the Committee of Gas Manufacturers. He is the head of a firm which will make a magnificent showing in this section.

The chairman of the Committee of Textile Manufactures is Charles Malcolm Kennedy, C.B. He is one of the principal officials of the English Foreign Office and one of the most efficient members of the committee.

The chairman of the Committee of Science and Education is Major General J. F. D. Donnelly, C.B. He is head official of the science and art department of Great Britain.

The Committee of Women's Work is composed of some of the most promient ladies of England. Among them are the Marchioness of Salisbury, wife of the British Prime Minister; the Countess of Aberdeen, the wife of the most popular Lord Lieutenant that ever governed Ireland, and Mrs. Fawcett, the widow of one of England's most noted postmasters-general.

On the Grounds.

Four thousand eight hundred men have been employed on the World's Fair grounds during the past week, the largest force since the work began.

There has been an increased force of carpenters on the Electricity, Manufactures, Machinery and Agriculture buildings, and the force of exterior coverers has been increased, and the gang of iron men on the Manufactures and Machinery buildings has swelled the number.

The first steel truss on Machinery Hall has just been placed. These trusses are 100 feet high, span 130 feet, and weigh 90,000 pounds. There will be 45 of them.

The iron workers on the Manufactures—a gang of 75 men—are still at work on the big traveler. They now have three breadths of the traveler in position out of a total of ten. The first steel truss of the Manufactures Building will probably be put in place early in April. The carpenters are still working on the pavilions and connecting walls, and are well advanced with the work.

Ground has been broken and work begun on the annex of the Horticulture Building. This greenhouse annex will be 570 feet long by 48 wide. The central portion of it will contain heating boilers, and the house will extend for 200 feet on either end of the boiler house, which is 170 feet long.

The sheathing is being placed on the dome of the Horticultural Building down to the point where skylight work begins, and the roof is finished on the north pavilion, and the skylight work for the west curtain is more than half done. The exterior covering is progressing well, and much of the beautiful Cupid frieze has been placed.

The plasterers are finishing the end rooms in the Woman's Building, the rotunda being completed, and the permanent floor is being laid.

The carpentry work on the Illinois Building is proceeding well, and the structure now represents above 1,500,000 feet of lumber, which is more than half of the total number of feet of lumber to be used.

The glass to be used in these great structures runs into enormous figures. The main World's Fair buildings, exclusive of what will be necessary for their roofs and for their interior finishing, require 250,000 panes of glass and about 250 tons of paint. An expediture of almost $500,000 is necessary for these items. The great Manufactures Building requires 50 tons of paint and 30,000 panes of glass of 26 different sizes, the average size being 27 x 44 inches. In the Transportation Building will be 112 circular sashes, 12 feet in diameter, each containing 37 lights, and 68 semicircular sashes, 22 feet in diameter, having 60 lights each. In the Electricity Building there will be 40,000 panes of glass, or more than in any other exposition structure. This building will be especially conspicuous at night, as, owing to its extensive glass surface, the brilliancy of its electrical exhibit will be strikingly visible from the outside. The Administration Building requires only 4500 lights of glass, yet it will present finer artistic effects in glazing than will any other structure. The climax of ornamental glazing will be seen in a great ceil-

ing sash in the mammoth dome, 200 feet above the floor of the rotunda. This will have 150 lights many different sizes and of beautifully contrasted colors.

Mexico Wants to Show Progress.

President Diaz does not favor the introduction of an Aztec temple for Mexico's State Building at the World's Fair. He has just told the Exposition Commissioners, Messrs. Payne and Curtis, who are working there, that he does not propose to make an exhibition of Mexican antiquities. He says he is willing to send to Chicago whatever there may be in their museums of this character, but will spend no money to make collections. He says that he will spend the money that is appropriated for the exposition in exhibiting the resources and products of the country. His own words are, "I would rather show the progress of Mexico than the ruins of the country." Commissioners Payne and Curtis expect, however, that a grand exhibit will be made. General interest in the fair, they report, is increasing.

Design of California's Building.

According to the design accepted the California Building will be characteristic of the great Pacific Coast State, picturing in its exterior the California of the Padres and in its interior the California of to-day. While the architect has closely followed the old mission style he has interjected enough of the more ornate Moorish to relieve the somewhat somber effect of the old churches, and he gives the required light and roominess.

Outside there will be a clear story with a great, flat central dome as the crowning feature and a roof garden to highten the semi-tropical appearance. From the ground to the eaves will be 50 feet, and to the highest point of the roof proper 65 feet, while the elevation of the dome will be 80 feet. Those portions of the roof not devoted to the garden will be closely copied after the quaint adobe buildings of the early Spanish settlements, with genuine earthenware tiles, deep red in color, semi-cylindrical and overlapping. The dome and middle portions will be tiled with iron plates curled and shaped like the original roofing. The material of the walls is to be wood, treated with some sort of cement and worked into a close imitation of the yellowish gray adobe of the old days. On the four corners and flanking the dome will be towers designed after the mission belfries, and in them will be swung some of the old Spanish bells which have outlived the Padres and their crumbling churches.

The interior will carry a gallery giving an area equal to two-thirds of the ground floor. This will be set apart for the offices, which will be grouped so as to command a clear view of the main floor. The ground plan will be one vast exhibition hall, the arrangement of compartments conforming to the extent of the displays as decided upon by the commissioners. The total floor space will be 100,000 square feet, of which the gallery will afford 40,000, the extreme measurements of the building being 500 x 110 feet main width.

The successful design is the work of A. Page Brown. The drawing which won the second prize is much like it, exhibiting the same general style of architecture and arrangement of dome and composite towers. Brown's estimate of cost is $75,000, but in his sketch he added a plan for laying out the grounds with broad driveways, hedges of cypress, and parterrers. His suggestion as to the roof garden is that it be made up of plants and shrubs characteristic of the State, and that it be made the pleasure ground of the California department, while the dome could be utilized for a *café*, if deemed desirable.

Kansas' World's Fair Building.

The first prize for plans and specifications for a Kansas Building at the World's Fair has, by the unanimous vote of the Board of Managers, been awarded to Architect Seymour Davis of Topeka.

The building, according to the plans, will be arranged to afford 13,934 square feet of floor space upon the first floor. Of this amount 4058 square feet in the rear of the building will be devoted to the natural history collections of the State University and 3340 square feet in the front for headquarters and accommodations, leaving 6336 square feet in the center of the building for exhibits. The general form of the building is cruciform, and the architect has aimed to leave twenty feet all around the building.

The main front entrance will be through a 16-foot arch with a vestibule 23 x 13 feet Three sets of double-acting doors will open into the main hall. On the right will be located the general offices and on the left a checkroom, janitor's quarters, &c. The main exhibit room is 133 x 48 feet, is lighted from the dome, and an opening through the second floor, the size of the dome, 80 x 41 feet, extends to the glass roof, 53 feet above. The main hall is 14 feet high.

The Frick Exhibit.

The H. C. Frick Coke Company, Pittsburgh, have commenced work on the exhibit which this firm will have at the World's Fair in Chicago in 1893. Robert Ramsey, superintendent of the Standard coke plant of this firm in the Connellsville region, has decided to exhibit a working model of the Standard shaft, of which Mr. Ramsey was the designer and builder. The company have been allotted an 80 foot space at Chicago; 40 feet of this will be taken up by the model, while in the balance will be shown samples of crushed coke and a topographical chart of the Connellsville region with the location of the different Frick plants and farms. The model will be made exactly one-twenty-fifth the size of the original, and will be exhibited on a stand about 3 feet high.

The whole will represent a section of the shaft proper, that will extend from the floor to the top of the stand, tipple, self-acting rams, bins, cages, winding apparatus, engine and boiler houses with every part of their machinery, workshop and even to the electric light plant, whose constructors have agreed to duplicate it in miniature in like proportion. In addition to these there will be shown several tenement houses and a block of ovens with the charging engines, larries, yard railroad track and freight cars loaded with coke.

All the parts where iron and steel appear in the original will be made of brass, which in the smoke stacks, railroad tracks, sheave wheels and the like will be nickel plated. The tipple, cross ties and other wooden parts will be of ash, trimmed with walnut. Of course, in a model of this size it will be impossible to have the boilers supply the steam, but the engines will show the workings of the cages and the rams, most likely by means of a secret motor. The ovens will be charged with something like asbestos, and by means of gas for fuel, the Chicago visitor next year can, barring the actual digging of the coal and considerable smoke, see how the coke is manufactured.

General Items.

Twenty-one States and Territories have made no appropriations for the World's Fair. Some of these are wealthy and have bills pending in their legislatures, while others are depending upon popular subscriptions. The greatest delinquency appears in the Southern States. With one or two exceptions their legislatures have failed to act thus far, but the people have taken hold of the work on stock company and popular subscription plans. In this work the women, through the impetus given by the Board of Lady Managers, are taking an active part, the leaders being members of the board; two members and two alternates represent each State and Territory.

Chief Burnham has been authorized to advertise for bids for the erection of the iron bridges across the lagoon at the park, aggregating an expenditure of $16,000. The bridges are to be placed as follows: One from the main court to the Manufactures Building and one from the north end of the Electricity Building to the central entrance of the Manufactures and Liberal Arts Building.

The contract was awarded to Messrs. Bailey, Koerner & Co. for the cement roofing of the Forestry Building in the sum of $830.

The United States Senate has passed a bill introduced by Senator Sherman, which is intended to relieve foreign exhibitors at the fair from any of the restrictions of the United States patent laws. The bill reads as follows: "That no citizen of any country shall be held liable for the infringement of any patent granted by the United States or any trade-mark registered in the United States, where the act complained of is performed in connection with the exhibition of any article or thing at the World's Columbian Exposition at Chicago." This bill disposes of a question of great importance to foreigners, who have been for months trying to find what relation they would bear to the patent laws.

Inquiry made by a Brooklyn, N. Y., firm of the Treasury Department regarding machinery imported for exhibit at the Chicago Exposition elicited a prompt response from Acting-Secretary Spaulding. He held that machinery brought over to the United States for the purpose of illustrating a certain manufacturing process at the exposition would be admitted free of duty. Raw material, however, imported for use in such a manufacturing process would be subject to duty under all circumstances.

Unofficial information has reached Chief Handy's department that the Minister of Finance of Russia, with the consent of His Majesty, has decided to pay all the freight charges on Russian exhibits sent to the fair. The Minister will also pay the insurance and the expense of decorating the Russian section. Chief Handy says this is the first instance of such sympathy being shown by Russia in any foreign exposition.

Two ancient Greek vases, made of baked clay, and which are reputed to be 20 centuries old, were received at the Chicago Custom House, consigned to Potter Palmer. The vases were procured from a Parisian dealer in antiquities. They will be exhibited at the fair.

Plans for the Ohio State Building were accepted by the Construction Department. The estimated cost of the building is $35,000. It will be put up largely of Ohio materials contributed by the various industries of the State.

Advices from the Gogebic range state that last week 800 timbermen from the Ashland, Aurora, Norrie, East Norrie and Pabst mines at Ironwood went on a strike. They demand an additional 25 cents per day. The companies will not yield. It is likely to result in a general strike, covering the Gogebic and Penokee ranges. The companies say that if the strikers persist much longer the mines will close down.

Dr. Roesing of the Friedenshuette, Silesia, enriches poor argentiferous lead by blowing it in a basic Bessemer converter.

The Chicago Water Jacket Syphon Condenser.

The accompanying cuts represent a condenser of novel design made by the Chicago Water Jacket Condenser Company of Chicago, Ill. The condenser works on the natural syphon gravity principle. The left-hand engraving is a part section of the condenser, with the relief valve above the exhaust pipe, which will allow the exhaust to escape if the water supply fails.

It has a solid rubber seat, held in place with dovetail flanges. The large bulge on the condenser shows water around the brass nozzle and condensing chamber, making ample condensing capacity by water jacketing these parts. Water passing down in a funnel shape, through the small neck of the condenser, surrounding the steam, completely condensing the same, and forming into a solid column, gravitating into the hot well. The brass nozzle can be adjusted by jam nuts on top to raise or lower the nozzle to admit water to suit the load of the engine. The lower nuts hold down the stuffing box or gland. Fig. 2 shows the condenser attached to engine with water-supply pump set in its proper manner to make best results. In all cases the hot wel. should be set as near the engine and low as can be drained away without danger of high water backing up on discharge pipe to make less than 34 feet from water inlet to the condenser. The supply pump works against but very little pressure, as the vacuum does most all of the work. It is claimed that this condenser will affect a most material saving, and that it will give 24 to 26 inches vacuum when properly set and all joints air tight, with a water supply of 1 to 1½ gallons per minute to each horse-power of the engine.

The Haswell Browning Process.

The changes that occur on iron and steel and to a lesser degree on most metals when exposed to the air, are caused by a process of oxidation; by means of a combined action of oxygen, carbonic acid, ammonia and water on iron or other metals, the oxygen of the atmosphere combines with the metal, forming, in the case of iron and steel, red oxide of iron, well known as rust. As carbonic acid gas, ammonia and water in a gaseous state are never missing constituents of our atmosphere, it is easily seen that the only effective means to prevent iron, steel and metals in general from rusting is by excluding the action of air and water from the surface of the metal by a coating impervious to water and air. The aim of all devices against rusting and corrosion of metals points, therefore, to the choice of as dense and water-proof a material as possible, with which the article to be protected must be coated, and which must, besides this, fulfill the following conditions: The material of the coating must adhere perfectly to the surface of the metal, so that in case of removal of any part of it, either by a violent blow or very rough usage, the coating surrounding that spot shows no tendency to peel off.

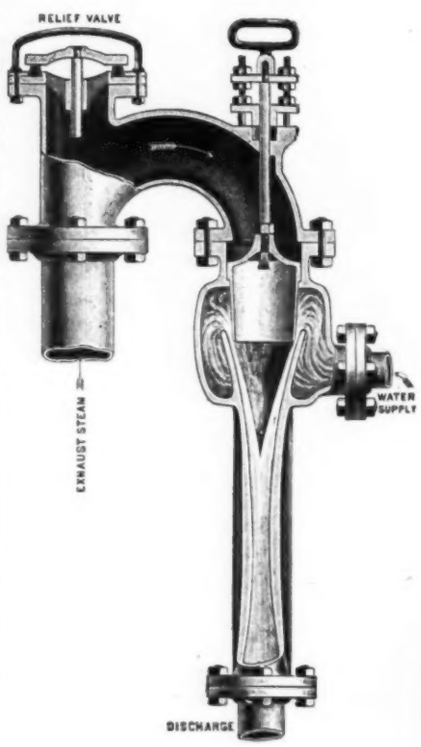
This material must bear no chemical affinity to the metal which it is to protect, whether dry or moistened it must not create any changes on the surface of the article; it must be sufficiently hard so as not to be removed readily by wear and tear of the article when in use

The material must show no changes when exposed to the action of moisture, water, the normal constituents of the atmosphere, and diluted mineral or organic acids, and it must stand not only usual changes of temperature, but permit of a rise of temperature up to the melting point of tin—228° C.

But above all, in order to be a perfect protection against rusting, the aggregate of the coating must be so close that water in a liquid state does not penetrate the coating. This latter condition can only be fulfilled to a certain extent, as there is no substance known, including galvanically deposited metals, to be perfectly free of pores, and we must therefore be prepared to find that the protection any coating, including the Haswell galvanic browning, can afford against the continual action of water in a liquid state can be but limited, for although the Haswell galvanic deposit, or browning, is so dense that water poured on it shows no adhesion, and can be thrown off, leaving the surface dry, as if it had previously been rubbed with oil, still, under continual action, when water remains on the surface a number of hours, a spot will show where the water commenced to penetrate, and these spots in time will show rust marks.

In the Meritens process the steel object is fixed to the anode pole of a galvanic battery, and is inserted into hot water, where it becomes oxidized, but in this process likewise repetition of treatment is necessary, and according to Bower-Barff's system of producing the black oxide on steel or iron, the article to be treated is brought to a dull red heat in a closed vessel, while a jet of superheated steam passes over it.

The Haswell Patent Galvanic Browning Process Company, of which Frederick Howlden, 158 Broadway, New York, is manager, are introducing a process which consists in a deposit mainly of peroxide of lead, prepared by electrolysis of a suitable solution of lead salts in cold water. The deposit is produced and completed in twenty minutes, and does not require more than one treatment.



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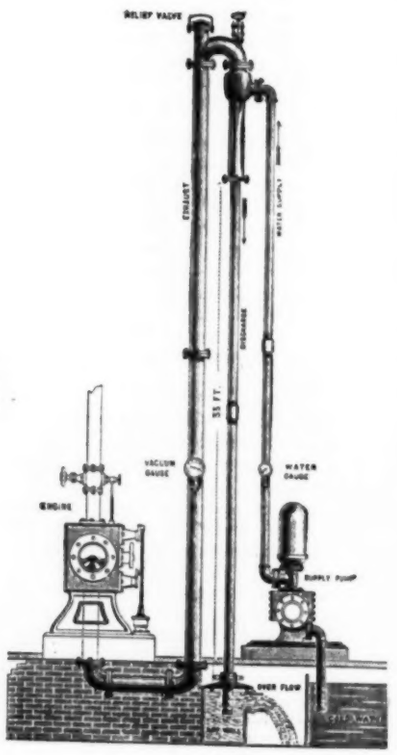


Condenser Attached to Engine with Water Supply Pump.

THE CHICAGO WATER JACKET SYPHON CONDENSER.

Steel plates coated with the Haswell galvanic deposit have stood the action of water by total submersion up to 48 hours, but this is about the limit, and therefore the inventors do not claim their deposit to be a protection against the action of water in a liquid state. They maintain, though, that their deposit stands this crucial test better than any browning or bluing hitherto achieved on iron or steel, and by far better than electro-metallic deposits such as nickel, tin or zinc.

Moist atmosphere, as well as such more or less ladened with acid fumes, as in chemical laboratories, have no deleterious effect on iron and steel articles that are browned according to Haswell's process, and in so far the inventors claim their galvanic browning to be anti-corrosive.

The browning now in use on iron and steel consists of a film of magnetic or black oxide of iron, which is prepared on the article itself by means of an alternate treating with chemicals that oxidize the surface, and heating and scratching with a steel brush; the articles (rifle barrels, for instance), undergo this procedure four to five times, taking from three to four days to complete.

The chemical and physical properties of the Haswell electro deposit are such that it may claim a very wide field for application. It adheres perfectly to the surface, and is exceedingly hard. Articles coated with this browning bear being pressed against a circular steel brush making upward of 1000 revolutions per minute for several seconds, and it stands rubbing hard with fine pumice stone powder, wet or dry, on a piece of felt. The aggregate of the deposit is so dense that it takes a number of hours before water penetrates the surface. The browning can be given a very high polish, gaining in appearance and density, so that it is unnecessary to polish the steel or iron surface previous to browning. Browned articles show no rust when exposed to moist atmosphere. The browning shows no change when made hot; it will bear a rise of temperature up to and beyond the melting point of tin (228° C.), and is not affected when suddenly cooled. The thickness of the coating is about that of a thin enamel, which it also resembles, and it might therefore be designated as Haswell's electro enamel.

This system of browning seems to be principally adapted to all such manufact-

ures that are not continually exposed to the action of water, and which have hitherto been protected from rusting by paint, varnish, or oxidized as described above.

We cannot here enumerate all manufactures to which this system of browning can be applied with advantage, but it will suffice if we mention that it has been adopted for browning rifles and other fire arms, parts of machinery, castings for indoor use, such as door handles, bolts, racks, &c., different kinds of tools and other implements, scythes, &c., to call attention to the technical value of this invention. The cost of the browning is said to be very moderate.

The Taylor Nut Lock.

The principal characteristic of the nut lock, which is the invention of E. W. Taylor of Salt Lake City, Utah, is in the shape of the grooves formed in the nut. It will be observed that the two grooves D and E are cut through the inner or threaded surface of the nut in a direction parallel with the axis. Each groove is further formed with what we might term a side extension for its whole length and which is not so deep as the groove proper, as shown in Figs. 1 and 2. The side extensions are placed on opposite sides of the grooves. When the nut has been placed at the desired position upon its bolt, a pin, C, is inserted in the groove

Fig. 1.

Fig. 2.

Fig. 3.

THE TAYLOR NUT LOCK.

D, when the nut can be moved forward freely upon the bolt, but is locked from a backward movement, owing to the binding of the pin in the side extension. By taking the pin out of this groove and inserting it in the groove E, the nut has a backward independent movement, but is locked from a forward movement. When a rivet is inserted in each groove the nut cannot be moved either way.

The pins may be smooth or provided with parallel file-like teeth running lengthwise therewith, so as to bite the surface of the groove and the threads of the bolt, but without injury. These pins are made to fit snugly and when the nut is locked the tension is so great that they are prevented from falling or working out. If the nut is moved by a jar or otherwise, it must be in a direction opposite from that in which it is locked. For example, if the locking is against a backward movement the jar will automatically tighten the nut and lock it. This locking device has been tried for several months and with the greatest success on the Rio Grande Western Railroad and the cars of the Rapid Transit Street Railway of Salt Lake City.

A Dresden, Germany, firm is introducing a compound of glass and wire, which possesses remarkable resisting power to sudden changes of temperature. The process of manufacture consists in furnishing glass while in a hot plastic condition, with a flexible metallic layer like wire netting, the metal becoming completely imbedded in the glass, and thereby being effectively protected from rust. As a proof of the toughness of the compound, it is said that the glass may be sprinkled with cold water while it is in a highly heated state without the surface being materially damaged. The glass made by this process is especially adapted for skylights, the powerful resisting qualities of the material rendering the use of the ordinary wire protectors unnecessary. It has also been successfully employed for the manufacture of hollow glass ware, and is particularly suitable for making glass vessels which have to stand a high pressure, or which are subject to hard usage. As the glass cannot be broken without causing considerable noise, and as it is not readily cut with a diamond, it is claimed that the substance is in a measure burglar proof.

Carbon Furnace Brick.

F. Burgers of Gelsenkirchen, who has done so much to test and introduce the use of carbon brick for lining blast furnaces, writes to the editor of *Stahl und Eisen* in regard to a number of cases brought to his notice recently where bottom carbon brick did not prove satisfactory. It appears that some of the bricks near the tapping hole were loosened and made their appearance in large pieces at the tap. The same experience was had at Gelsenkirchen, so that in later designs very much larger brick has been used for the bottom. No trouble is found in producing 24 to 27.5 inch brick, and Burgers expresses the belief that their use will completely overcome the trouble. Furnace No. 2 at Gelsenkirchen, blown in during 1886, has a hearth in excellent condition without water cooling. Furnace No. 5, blown in during May, 1891, has a carbon brick lining for bottom, hearth and boshes, and is in good condition, although neither bottom nor hearth are water cooled.

The two Swedish canals—Trollhattan and Gota—with their 74 locks, perfect the waterway across the peninsula from the Baltic to the North Sea, which in its entirety amounts to 255 miles, at a cost of $603,000 and $4,154,000 respectively. By the opening of the latter, Gothenburg, situated at the mouth of the Gota River, becomes the leading commercial city in the kingdom.

British shipbuilding during the year 1891, it can now be stated with accuracy, made a total output of 1,142,000 tons, all of steel and iron, of which 927,000 tons were steamers. Allowing for sales of tonnage and losses, the net increase for the year of British tonnage is 502,000 tons steamers and 30,000 tons sailers. The conspicuous feature is the increasing size of cargo steamers, commonly called tramps, vessels carrying 6000 to 7000 tons being numerous. Aside from two of extraordinary size and speed for the American trade, few large liners were built, and there is little contract work in progress, although dividends were better than during the previous year. Few steamers are now lying up.

The Growth of our Iron Industry.

James M. Swank, the general manager of the Iron and Steel Association, has just issued the eleventh edition of his famous Directory of the Iron and Steel Works of the United States, Canada and Mexico. Mr. Swank reviews in the preface the development of the industry during the two calendar years 1890 and 1891, as follows:

Blast Furnaces Built and Building.

In the edition of the directory for 1890 we enumerated 575 blast furnaces as being active at the close of 1889 or likely to become active. In the present edition we describe 569 furnaces, or six furnaces less than at the close of 1889. The total of 569 furnaces is reached after noting the new furnaces which were completed during the last two years and eliminating the old furnaces which were wrecked or abandoned during the same period. The new furnaces number 52, of which one is anthracite, 35 are coke and 16 are charcoal. The furnaces abandoned or torn down number 58, of which 22 were anthracite, 14 were coke and 22 were charcoal. Of the 569 furnaces described in the present edition 164 use anthracite coal or mixed anthracite and coke; 267 use bituminous coal or coke and 138 use charcoal.

The new furnaces which were completed in the two years mentioned include one charcoal furnace in Connecticut, one anthracite and six coke furnaces in Pennsylvania, one charcoal and two coke furnaces in Maryland, one charcoal and six coke furnaces in Virginia, two charcoal and three coke furnaces in Kentucky, one coke furnace in Tennessee, one charcoal furnace in Georgia, two charcoal and seven coke furnaces in Alabama, three charcoal furnaces in Texas, one charcoal and two coke furnaces in Ohio, six coke furnaces in Illinois, four charcoal furnaces in Michigan, one coke furnace in Minnesota, and one coke furnace in Colorado. In all the other States which have a blast-furnace industry no new furnaces were built in 1890 or 1891. In addition to the furnaces which were completed in these two years the building of 11 other furnaces has been undertaken and is now, at the beginning of 1892, in progress—namely, six coke furnaces in Virginia, one charcoal and three coke furnaces in Tennessee and one coke furnace in North Carolina. All these are in Southern States. Not one new furnace is now in course of erection in any Northern State, although the foundations for a new furnace at Buffalo have been laid. In November, 1887, there were 30 furnaces in course of erection in the whole country, and in November, 1889, there were 27 furnaces.

Of the new furnaces which were built in 1890 and 1891 it is noticeable that 16 were charcoal furnaces, located in nine States, even New England rebuilding one abandoned furnace. The building of three of these furnaces in Texas emphasizes the fact that this State is now entitled to recognition as one of the promising iron-producing States of the Union. The building of four new charcoal furnaces in Michigan is an event which is also significant. This State is within such easy communication by railroad and water with great centers of pig-iron consumption, especially for foundry purposes, that, with its rich iron ores and still abundant supplies of accessible timber, no good reason exists why it should not continue to increase its annual production of charcoal pig iron.

There was a great decline in the building of new furnaces in Alabama in 1890 and 1891 as compared with the furnace-building activity which had prevailed in

this State in immediately preceding years. At the close of 1887 there were 24 completed furnaces in Alabama and 19 were in course of erection; two years later there were 44 completed furnaces in this State and eight were in course of erection, 20 furnaces having been completed in these two years. But in 1890 and 1891 only nine furnaces were built in Alabama, eight of which had previously been undertaken, while at the close of 1891 there was not one new furnace in this State in course of erection.

Far different has been the course of events in the last two years in Virginia. From the close of 1887 to the close of 1889 this State built only two furnaces and abandoned three, the whole number decreasing from 33 to 32, with two new furnaces under construction. But in 1890 and 1891 Virginia built seven new furnaces, and at the close of the latter year it had six additional furnaces in course of erection. Its progress in the building and projection of new furnaces in the last two years was greater than that of any other State, Alabama coming next. After Virginia and Alabama the Southern State which has manifested the most activity in furnace building in 1890 and 1891 is Kentucky, which completed the erection of five new furnaces in these two years.

Pennsylvania built only seven new furnaces in 1890 and 1891, and Ohio built only three, but Illinois built six, which was relatively a much larger addition to its blast-furnace capacity than that made by either Pennsylvania or Ohio. Illinois now has 20 completed blast furnaces, all using coke, whereas there was not one furnace in operation in this State from 1860 to 1869, in which latter year the first two furnaces at Chicago were completed. There are now 16 furnaces at Chicago and in its immediate vicinity in Cook County.

The furnaces which we have noted as having been abandoned or torn down in 1890 and 1891 include one anthracite and one charcoal furnace in New York; three anthracite furnaces in New Jersey; one charcoal, 14 anthracite and three coke furnaces in Pennsylvania; three anthracite, one coke and two charcoal furnaces in Maryland; six charcaal furnaces in Virginia; two coke furnaces in West Virginia; two charcoal furnaces in Kentucky; one charcoal furnace in Tennessee; one charcoal furnace in North Carolina; six coke furnaces and one charcoal furnace in Ohio; two coke furnaces in Illinois; and one anthracite and seven charcoal furnaces in Michigan. It is but just to say that most of these furnaces have not recently been active, and that many of them, owing to bad location and antiquated equipment, were virtually abandoned years ago. So long, however, as their owners insisted that they might again be put in blast on short notice, we could not place them on the abandoned list. Most of the furnaces now noted as having been abandoned in 1890 and 1891 were of small capacity, whereas all the new furnaces built in these years are of large capacity and equipped with improved machinery.

Blast Furnace Capacity.

With 52 new furnaces of modern style and equipment built in 1890 and 1891, and with 58 antiquated and generally small furnaces relegated to the abandoned list in the same years, it may fairly be assumed that the 569 furnaces which are now borne in our active list are furnaces which in the main our country may be proud of. Their annual aggregate capacity is placed by the owners themselves at16,296,793 net tons, or an average of 28,641 net tons annually for each furnace. Stated differently, the aggregate weekly capacity is 313,400 net tons, or an average of 551 net tons weekly for each furnace. As late as November, 1887, the average annual capacity of the furnaces which were then active or likely to be some day active was 18,885 net tons, or 363 net tons per week, and in November, 1889, the average annual capacity of the furnaces in the same list was 22,901 net tons, or 440 net tons per week. In November, 1887, the aggregate capacity of 582 furnaces was 10,990,993 net tons, and in November, 1889, the aggregate capacity of 575 furnaces was 13,168,233 net tons. The growth in the aggregate and individual capacity of American furnaces in the last four years is thus seen to have been remarkable. Of course, as we have often explained, all our blast furnace capacity cannot be utilized at the same time, but it will be seen at a glance that our capacity to-day which can be employed at the same time is beyond any prabable requirements of the immediate future, and herein lies the chief cause of the present low prices of pig iron.

Rolling Mills and Steel Works.

In the present edition we enumerate and describe 460 completed rolling mills and steel works in the United States, of which 425 contain trains of rolls and 35 have no rolls. In the edition of two years ago we described 445 completed rolling mills and steel works. In the intervening time 43 new rolling mills and steel works have been built and 28 have been abandoned, the net increase in the period mentioned being 15. In January, 1892, there were 18 rolling mills and steel plants in course of erection, against a total of 11 works which were in course of erection at the close of 1889.

Rolling Mill Capacity.

The production of puddled iron in this country is not by any means a decaying industry, as we have already stated that our production of rolled iron in 1890 was greater than ever before in our history. Our puddling furnaces increased from 4882 in November, 1887. to 4914 in November, 1889, and from the latter date to January, 1892, there was a further increase to 5120.

Bessemer Steel Works.

Our Bessemer steel industry, which has for many years been the first in the world, has been still further developed during the past two years. Since the appearance of our last directory we have built six new standard Bessemer plants—one at Pittsburgh. to make steel castings; one at Sparrow's Point, in Maryland, with converters of the largest capacity, to make steel rails chiefly; one at Ashland, Ky., to make steel for nail plates and billets; one small plant in Ohio, and a larger one in East St. Louis, Ill., both to make steel castings, and one at West Superior, Wis., to make steel plates, bars and structural shapes. We now have 46 standard Bessemer plants, with 95 converters. Two new standard Bessemer plants are now in course of erection, both in the Shenango Valley, in Western Pennsylvania, one to produce castings, with a single converter, and the other, with two converters, to produce billets. In addition to the standard Bessemer plants above mentioned we now have five Clapp-Griffiths and four Robert-Bessemer steel plants, the former with nine converters and the latter with six converters. No new Clapp-Griffiths or Robert-Bessemer plants have been built since 1889.

Since the appearance of our last directory two small Bessemer plants have been abandoned—one in Ohio and one in Pennsylvania—and in the same time three Clapp-Griffiths and three Robert-Bessemer plants have also been abandoned. Included in the 46 standard Bessemer plants which are described in the present edition is one which was formerly operated as a Clapp-Griffiths plant.

Open-Hearth Steel.

Our open-hearth steel industry has made even greater progress in the last two years than our Bessemer steel industry. Two years ago we noted a great advance in the erection of new open-hearth plants, but during these two years our progress in building open-hearth plants has really been remarkable, especially if it be considered that 1891 was a year of dullness and reaction in our iron and steel industries taken as a whole. During 1890 and 1891 we built 17 new open-hearth steel plants, while only three were abandoned, two of which were very small plants. We now have 71 completed open-hearth plants, and in addition four new plants are in course of erection, while another, a very large one, is nearly completed.

Crucible Steel Works.

Our crucible steel industry makes no progress, but, upon the other hand, it does not retrogade. Two more crucible plants are enumerated in the present edition than the edition of two years ago, six plants having been abandoned in the meantime and eight having been built. We now have 45 completed crucible steel plants and one in course of erection, against 43 completed and three building two years ago.

Basic Steel.

During the past two years the production of basic steel in this country, chiefly in the open hearth, has made considerable progress, but it has not yet risen to a position of importance except at two or three works in Pennsylvania. Although much has been claimed for the South as the natural home of the basic process in this country, that section has now only one establishment which is actually making basic steel. Nor has the South made that progress in the last two years in the production of steel of any kind that has been expected of it by its best friends. May it do better in the near future!

Cut-Nail Machines.

In November, 1887, there were 81 rolling mills, which were devoted in whole or in part to the manufacture of cut nails and spikes, and which contained 6350 nail machines. In November, 1889, the number of rolling mills which manufactured cut nails and spikes was 75, with 6066 nail machines. In January, 1892, the number of rolling mills which contained cut-nail machines had declined to 65, and the number of nail machines to 5546. These figures show a decrease of 804 in the number of cut-nail machines from November, 1887, to January, 1892.

Wire-Nail Works.

The wire-nail industry has grown rapidly in this country during the last two years. In the directory of two years ago we enumerated 37 wire-nail works; in the present edition we enumerate and describe 49 completed wire-nail works and two additional works in course of erection. These 51 works are located in 16 States. Their average capacity is much greater than that of the works of two years ago. In this connection it may be stated that there are now in the United States 21 works which roll iron or steel wire rods and one additional works in course of erection, and that we now have 53 completed iron or steel wire drawing plants and two additional plants in course of erection, all of which are described in the present edition.

Tin-Plate Works.

In the edition of the directory which was published two years ago not one establishment in the United States was enumerated which produced tin plates or terne plates, although there were at that time a very few works producing stamped ware which in part tinned their own tin plates from purchased black plates. On October 1, 1890, the McKinley tariff be-

came a law, and one of its provisions increased the duty on tin plates from 1 cent to $2\frac{2}{10}$ cents per pound, this provision not taking effect, however, until July 1, 1891. With the encouragement given by this provision in the McKinley tariff we are now enabled to enumerate and describe 20 works in the United States which are either making or are prepared to make tin plates or terne plates, and ten additional tin-plate works which are in course of erection.

Forges and Bloomaries.

The classification which has always been observed in the directory counts all works which make wrought iron direct from the ore as forges, and all works which make blooms from pig iron or scrap iron for sale as bloomaries. Works which make blooms in connection with rolling mills and for use exclusively in these rolling mills are, however, not separately classified. They are not independent, but auxiliary enterprises.

Since the appearance of the directory of two year ago the number of forges making wrought iron direct from the ore has greatly declined. This branch of our iron industry, originally embracing forges of the strict Catalan type, has steadily retrograded for many years. Once it was prominent; now it is neglected and almost unnoticed. At the close of 1889 there remained 23 forges in the United States, most of which were in New York, and the remainder were in Vermont, New Jersey, Tennessee and North Carolina. At the present time but ten forges are left, all of which are in New York except one, which is in New Jersey. We have transferred to the abandoned list every forge in all the other States mentioned, although there is a bare possibility that one or two of these may some day again make a little iron. The number of independent pig-iron and scrap-iron bloomaries has also declined during the past two years. In the present edition we describe 20 of these enterprises, chiefly in Pennsylvania; two years ago we described 27; four years ago we described 37.

Miscellaneous Works.

In the present edition we describe 21 locomotive works, not including works operated by railroad companies; 31 wrought-iron pipe works, 43 cast-iron pipe works, 69 car-axle works, not including works operated by railroad companies, 109 car-wheel works and 105 car works, not including railroad works.

Natural Gas.

The use of natural gas as fuel in the rolling mills and steel works of the United States was noted in detail in the preface to the edition of this directory which appeared two years ago. The number of rolling mills and steel works which then used natural gas as fuel in whole or in part was 104, against 96 in November, 1887, 68 in August, 1886, and six in September, 1884. These figures indicated a very great increase in a very few years. During the past two years, however, there has been a very great decrease in the use of natural gas by our iron and steel works. The entire number of such works now using natural gas in whole or in part is 74, a reduction of exactly 30 works in two years. Of the total number of iron and steel establishments which were using natural gas two years ago 60 were located at Pittsburgh and in Allegheny County, Pa., 17 in western Pennsylvania outside of Allegheny County, six at Wheeling and its vicinity in West Virginia, 18 in Ohio and three in Indiana. To-day 45 are located at Pittsburgh and in Allegheny County, 11 elsewhere in western Pennsylvania, one in West Virginia, 11 in Ohio and six in Indiana. The development of the natural gas region in the central part of Indiana has been more marked during the past two years than in preceding years, and this development has resulted in the establishment of several new iron and steel enterprises in Madison, Hancock, Delaware and Grant counties. But in all the other natural gas sections of the country the use of natural gas as fuel in our iron and steel works has declined, as has already been stated, owing to the shrinkage in its supply. In most of the works which have been compelled to abandon or partly abandon the use of natural gas a return has been made to the use of bituminous coal, but some of these works have also introduced the use of producer gas made from coal, or of petroleum, and in a few works petroleum or gas made from coal is now principally used. There is observable, indeed, a strong tendency in many sections of the country to use producer gas or petroleum in the manufacture of iron and steel.

Fig. 1.—Perspective.

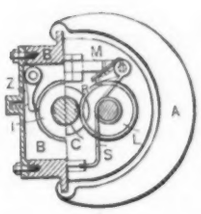


Fig. 3.—Sectional Plan.

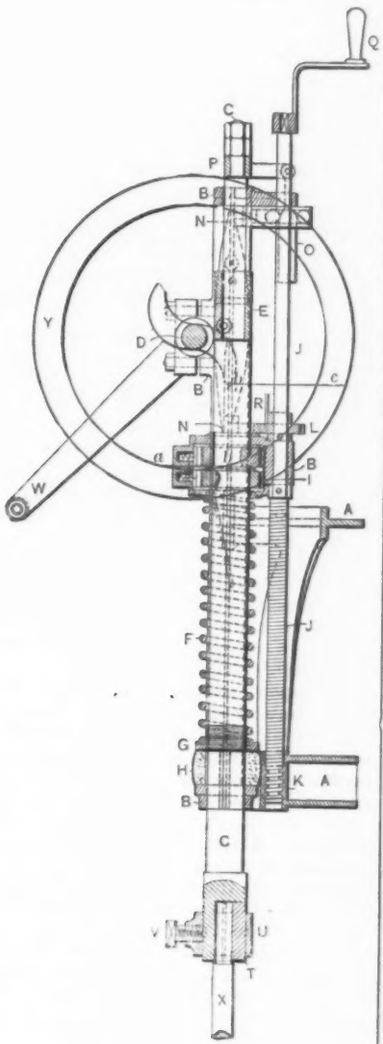


Fig. 2.—Vertical Section.

THE KING HAND POWER ROCK DRILL.

The King Hand Power Rock Drill.

The power for driving the King drill is derived from a spring which is alternately compressed and released by rotating cams under anti-friction collars. The drill steel is an extension of the drill bar and the crosshead or part which carries the drill bar, spring and cam shaft works in a gibbed shell or guide, which is in turn mounted on a tripod, column or drift bar, with a universal joint or swivel, which allows the drill to be pointed at any desired angle for drilling, according to the work to be done.

Referring to the drawings, Figs. 2 and 3, A A is a shell or guide, at the bottom and back of which is a cylindrical projection which enters a sleeve on the tripod. This projection is sometimes flanged to suit other makes of tripod column or drift bars. In the interior of the projection provision is made for the reception of the bronze feed nut K. The crosshead B B has on its edges slides which enter into gibbed guides at the top and bottom of the shell A A, as shown in Fig. 3. Through the center of the crosshead passes the drill bar, on which, above the cam shaft D is a loose collar E carrying anti-friction rollers; between this loose collar and tight collar is a ring of anti-friction metal for the purpose of allowing the drill bar to rotate easily and also to give more wearing surfaces.

At the lower end of the drill rod is a clamping device, V T U, and drill end X, U T being riveted together so that on loosing the set screw V the clamp will drop down over the drill, thereby allowing an easy and quick change of drills.

The motion is obtained by turning the crank W, which rotates the shaft and cam D under the collar E, raising the bar C and collar G, the latter being tight on the bar. The spring F is thus compressed between the collar G and the bottom of the gear box. After the end of the cam passes the roller the drill bar is forced downward

by the spring, so that unless the drill strikes the rock the blow will be cushioned on the rubber ring H.

At the place on the drill bar where it passes through the ratchet wheels I I is a straight and a spiral key way *b c*, and there are feathers in the ratchet wheels which slide in these ways. Pawls Z engage the teeth on these wheels, and on the drill bar being raised the pawl engages on the spiral, rotating the bar, but on its descent the straight way is engaged, preventing the bar from turning back again.

The slots are calculated so that the drill will strike 32 blows before it will strike again in the same place. The feed arm P rises with the bar and carries the feed bar O between rollers, Fig. 2, thereby forcing the plunger out to the upper end of the lever N, which is fulcrumed to the frame B. At the bottom end of the lever is the feed bar M and pawl R which, by the motion of the lever is carried back and rotates the feed wheel L, thereby feeding the crosshead B downward by means of the screw J and nut K. But unless the shoulder on the bar O descends below the center of the sleeve at the upper end of the lever no motion is imparted to the lever, and the crosshead remains stationary until the drill penetrates the rock enough to allow the tapers of O to pass below the center. The crank Q is used to return the crosshead to the starting point. This drill is made by the King Rock Drill Company of Pittsburgh, Pa.

Tinned-Plate Manufacturers' Association.

A meeting of the Tinned-Plate Manufacturers' Association of the United States, was held at the Monongahela House, Pittsburgh, on Wednesday, the 24th inst. The meeting was called to order at 10.30 a. m. by J. W. Britton of Cleveland, chairman, while C. R. Britton, also of Cleveland, acted as secretary.

The minutes of the previous meeting, held at the Hotel Anderson, Pittsburgh, on Wednesday, June 17, 1891, were read by the secretary and approved. A report of the last meetng of the Board of Managers, held at the Monongahela House, Pittsburgh, on November 18, 1891, was also read and approved. The wage schedule, by which is meant the wages to be paid for tin-house labor, was then taken up, and after considerable discusion a committee was appointed to formulate a wage schedule which shall apply on tin-house labor only, and directed to report at the afternoon session. The next question which came up for discussion was the terms on which tin plate should be sold to the trade. There was quite a variety of opinion, and after full discussion it was decided by the members of the association that the terms on which tin plates shall be sold to the trade shall be cash 30 days. The question of having a display of tin and terne plates at the Republican National Convention, to be held in Minneapolis, Minn., in June next, also came up and a committee was appointed consisting of C. R. Britton and W. C. Cronemeyer, who will have full charge of this matter. This committee was given full power to act and in all probability a display will be arranged that will do credit to the manufacturers of tin and terne plates in the United States. The question of having a tin plate exhibit at the World's Fair in Chicago in 1893 was also considered. It was the opinion of the members that the time had not yet come to move in this matter, and action on it was deferred until a later date. A communication from J. M. Swank, secretary of the American Iron and Steel Association, regarding the collection of statistics on the manufacture of tin plate was read and it was decided that as the Government has taken up the matter of gathering statistics the association was unable to avail itself of the offer of Mr. Swank. It was decided to advise Mr. Swank by letter of this action. The advisability of the Tinned-Plate Manufacturers' Association of the United States and the Iron and Steel Sheet Manufacturers' Association employing one secretary was brought up, and after being discussed by the members it was decided that the Board of Managers of the Tinned Plate Association should confer with the Executive Committee of the Iron and Steel Sheet Manufacturers' Association and take whatever action on the matter was deemed advisable. The Board of Managers was also instructed to take up the question as to how the funds necessary to carry on the work of the association shall be contributed. Under the arrangement now existing the initiation fee of $50 is now charged to each firm that joins the association. It was the sense of the meeting that funds should be raised by levying an assessment on the output of each concern that is a member, and in this way the necessary money can be raised and the amount enlarged. The matter was left in the hands of the Board of Managers, who will report at the next meeting of the association. An adjournment was then had until 3 p.m.

The association reconvened at 3 30 p.m., and the committee to formulate a wage schedule for tin-house labor reported the following as the wages to be paid for labor in the tinning department: Tinmen, 12 cents per box; washmen, 12 cents per box; cradle boys, 4 cents per box; 2 cleaners, 3 cents per box each; dusting, 2½ cents per box, all based on IC plates, 14 x 20, 112 sheets per box. No other action regarding wages to be paid by tin-plate manufacturers will be taken by the Tinned-Plate Association, as wages to be paid for the various kinds of labor in sheet mills will be in charge of the Iron and Steel Sheet Manufacturers' Association.

The report which has recently been widely published to the effect that the Tinned-Plate Manufacturers' Association of the United States proposed to ask Congress to increase the present duty of 2 2 cents per pound on tin plates was discussed, and the members expressed their sentiment on the subject by adopting a resolution to the effect that each and every member of the the Tinned Plate Manufacturers' Association of the United States believes the present duty of 2.2 cents to be adequate and equitable, and the association has no intention whatever of making an effort to have the duty increased. The meeting then adjourned subject to the call of the president.

The following is a complete list up to date of the members of the Tinned-Plate Manufacturers' Association of the United States:

Norton Brothers, Chicago, Ill.
St. Louis Stamping Company, St. Louis, Mo.
United States Iron and Tin Plate Mfg. Company. Demmler, Pa.
The Britton Rolling Mill Company, Cleveland, Ohio.
Somers Bros., Somerton Tin Plate Works, Brooklyn, N. Y.
Republic Iron Works, Pittsburgh, Pa.
The Welsh American Tin Plate Company, Philadelphia, Pa.
W. Dewees Wood Company, McKeesport, Pa.
The Piqua Rolling Mill Company, Piqua, Ohio.
Falcon Iron and Nail Company, Niles, Ohio.
Shoenberger & Co., Pittsburgh, Pa.
Marshall Brothers & Co., Philadelphia, Pa.
Bellaire Nail Works, Bellaire, Ohio.
Wellsville Plate and Sheet Iron Company, Wellsville, Ohio.
Ætna Iron and Steel Company, Bridgeport, Ohio.
The Standard Iron Company, Bridgeport, Ohio.
Alan Wood Company, Philadelphia, Pa.
Sharon Iron Company, Sharon, Pa.
McCullough Iron Company, Philadelphia, Pa.
The Pioneer Tin-Plate Company, Joliet, Ill.
Jones & Laughlins, Limited, Pittsburgh, Pa.
Jennings Brothers & Co., Pittsburgh, Pa.
Summers Brothers & Co., Struthers, Ohio.
The Chartiers Iron and Steel Company, Pittsburgh, Pa.
Kirkpatrick & Co., Pittsburgh, Pa.
Wm. T. Simpson & Co., Cincinnati, Ohio.
Blairsville Rolling Mill and Tin Plate Company, Blairsville, Pa.
Kieckhefer Brothers & Co., Milwaukee, Wis.
Coates & Co., Baltimore, Md.
Anderson Tin Plate Company, Anderson, Ind.
Columbia Tin Plate Company, Piqua, Ohio.
Wallace, Banfield & Co., Limited, Irondale, Ohio.
American Tin Plate Company, Elwood, Ind.
P. H. Laufman & Co., Limited, Apollo, Pa.
Canonsburg Iron and Steel Company, Pittsburgh, Pa.

General Gordon's design for a new ironclad destroyer is under consideration by the Naval Committee of the House of Representatives at Washington. The vessel is to be 260 feet in length by 40 feet in breadth and 16 feet draft, giving a displacement of 2400 tons, with a speed of 20 knots an hour. The vessel in size will be larger than the Yorktown and smaller than the Charleston. The feature of the design is found in an enormous submarine gun carried at the bow, below the water line, and a hydraulic buffer projects from the bows. This is so adjusted that it will stop the boat at a distance of 8 feet from the enemy's slip, without injury to the boat At this short range the buffer automatically discharges the submarine gun directly at the hull of the ship, and lodges within it a shell carrying a bursting charge of 450 pounds of powder, sufficient to blow down every bulkhead in the ship and wreck the bottom. The details of the boat, it is said, have been carefully worked out, and the calculations have been verified by experts.

Trade Publications.

THE KING ROCK DRILL COMPANY, of Pittsburgh, Pa., have just issued a catalogue descriptive of their hand-power drills. This drill is very light, and yet this admirable feature is obtained without sacrificing strength and durability. The force for driving the drill is derived from a spring which is alternately compressed and released by rotating cams under anti-friction collars. The spring requires a force of 300 pounds to compress it, and the reaction is equal to the work of a 3 x 3 inch cylinder working with 40 pounds of steam or air, but owing to the peculiar shape of the cams and their arrangement, a boy 12 years of age can easily run it at the rate of 200 strokes per minute. The drill steel is an extension of the drill bar, and the cross-head or part which carries the drill bar, spring and cam shaft works in a gibbed shell or guide, which is in turn mounted on a tripod, column or drift bar, with a universal joint or swivel, which allows the drill to be pointed at any desired angle for drilling, according to the work to be done.

THE POWERS DUPLEX REGULATOR COMPANY of 36 Dearborn street, Chicago, Ill., have issued a catalogue describing their automatic temperature regulator. This apparatus is called duplex because it has a double action —with steam and hot water it controls both the heater and the house, and neither can get too hot. These functions are entirely separate, and are performed each in its own time, and in perfect harmony with each other. In its application to steam and hot water the regulator consists of two essential parts, the diaphragm and thermostat; with hot water it has a third part called the generator. The diaphragm is attached to or in proximity to the heater. It is similar to the ordinary steam diaphragm, and consists of a yielding sheet of rubber clamped between two iron plates, with a piston and a flange resting upon it, which is lifted by pressure applied within. The piston is attached to a lever, and this by a chain to

the dampers. The thermostat is a flat disk, somewhat oval on its face, with an ornamental antique finish. When desired an accurate thermometer is furnished in connection with it, by means of which the temperature can be read across the room. This thermostat is hung in one central room, and is connected with the diaphragm at the heater by a lead tube concealed in the partition. When exposed to a temperature above 60° the thermostat generates an air pressure, which increases as the temperature rises. The air pressure passes through the tube into the diaphragm and operates the lever, which opens and closes the draft and check dampers. The force of the air pressure varies with every change of temperature in the house, and the dampers are opened and closed with a gradual movement, exactly in proportion to the temperature and the corresponding need of air in the fire. If the thermometer falls a little the draft opens a little. An additional drop in the temperature causes a still further opening, and when the normal degree of heat is restored the damper is nearly

forming presses, back-geared power presses for saw gumming, &c., power presses for cutting sheet-metal blanks of all kinds, power presses for closing side seams, power presses for wiring dies, power presses for very small work, drop presses, drop lifters, screw presses, lever and pendulum presses, soap presses, power and foot squaring shears, double seamers, bar folders, power crimpers, beaders, forming rolls, squeezers, trimming machines, and capping machines. The Clark kerosene oil heaters for heating fire-pots and floaters are also illustrated. A number of pages are devoted to information about dies which will be appreciated by the trade.

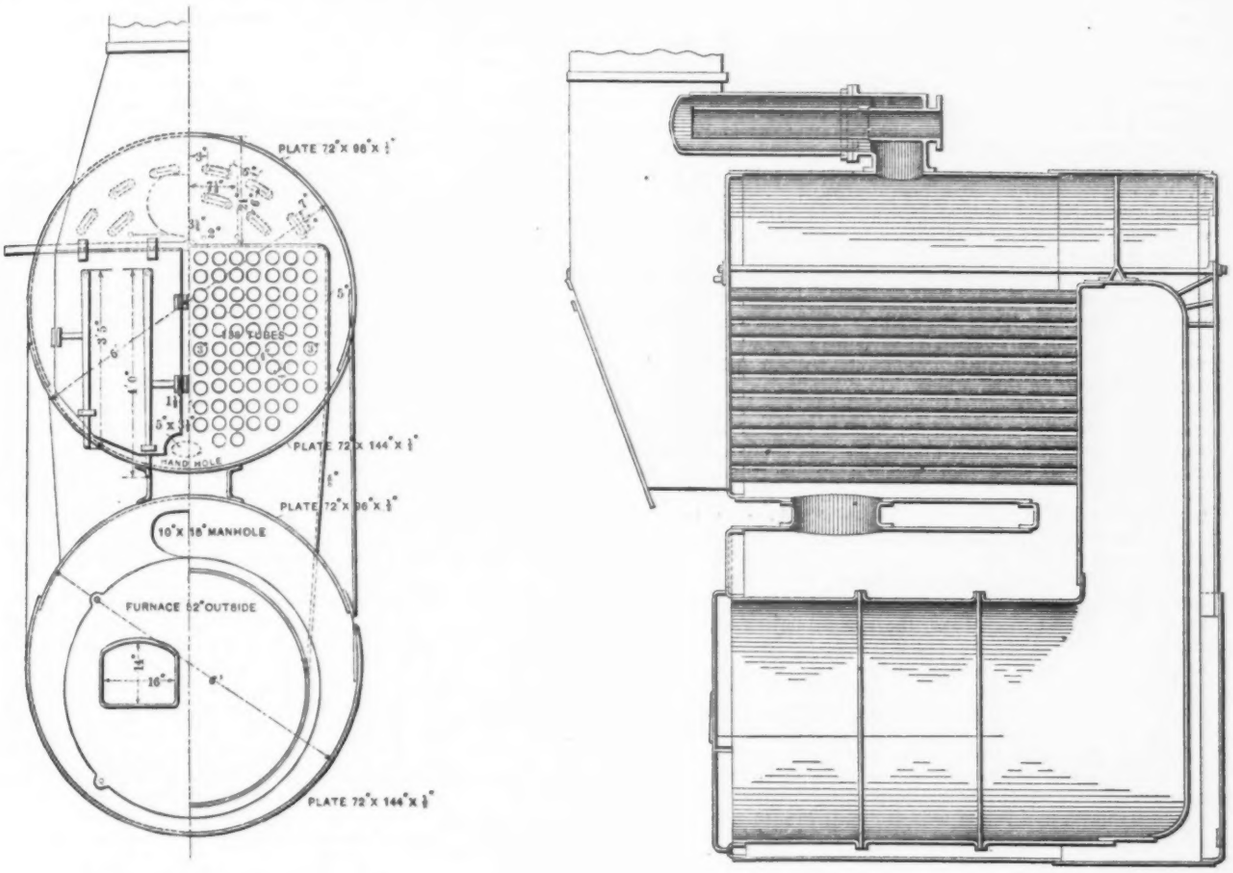
The Dundon Compound Steam Boiler.

P. F. Dundon of San Francisco, Cal., has designed a boiler, the construction of which he describes as follows: The lower

If placed in a steamboat the boiler would be entitled to a certificate for 135 pounds of steam.

Certificates show that this boiler has given most excellent and satisfactory results, and has proved to be economical in competition with water tube boilers of well-known design.

In the case of ex Sheriff A. E. McCandless *vs.* the Allegheny Bessemer Steel Works of Allegheny, Pa., Judge Slagle of Pittsburgh has handed down an opinion in the Court of Common Pleas to the effect that a steel company must pay the deputies who guard its buildings during labor disturbances. The suit was brought to recover $4000 for the services of deputy



End Elevation and Section. *Side Elevation.*

THE DUNDON COMPOUND STEAM BOILER.

or quite closed again. The generator serves to prevent a hot-water heater from boiling over.

G. A. Crosby & Co., 176 and 178 South Clinton street, Chicago, issue a very handsome 112-page catalogue of the presses, dies and special machinery which they manufacture. This concern was established in 1866, and has built up a large and constantly-increasing trade which not only extends all over the United States, but has also penetrated to many foreign countries. Since the issue of the last catalogue by this firm they have made many additions to and improvements upon their line of manufactures, replacing some of the older styles of presses with more modern patterns, dropping entirely the manufacture of others which have been supplanted by machines of newer design, and introducing innovations whose merits they feel confident their patrons will recognize. They call special attention to their patent automatic knock-out attachment and patent automatic friction brake, of which they are sole owners. The leading articles illustrated and described in this catalogue are as follows: Power punching presses, power

shell, which contains the furnace, is 72 inches in diameter, and the upper shell, which contains the return tubes, is also 72 inches in diameter. The combustion chamber is 24 feet long by 52 inches wide at the bottom, and 6 feet 4 inches wide at the top, and 10 feet high. The furnace is 52 inches in diameter and 6 feet 6 inches long, made in three sections, flanged out at the ends of the sections with flanges riveted on to each other, having a calking ring of 2¼ x ½ inches Norway iron between. The back end of the furnace is flanged outward to connect with the tube sheet, thus having no double thickness or rivets on any part of the crown sheet. The upper shell contains 138 tubes 3 inches in diameter by 6 feet 6 inches long.

The boiler is made of ½-inch steel, 60,000 pounds tensile strength, throughout, except the back, sides and crown of combustion chamber, which is $\frac{7}{16}$ inch, and the construction throughout is in accordance with the marine laws and to comply with United States steamboat inspection.

sheriffs who did duty at Duquesne while the strike of 1888 was in progress. The company refused to pay the sheriff on the ground that such a contract would be contrary to public policy and in opposition to the old English law that it was the sheriff's duty always to maintain order. Judgment was ordered to be recorded in favor of the plaintiff for the amount of the verdict.

Lake shipbuilders are having a busy winter. Altogether there are 45 vessels in course of construction, of which 2 are steel and 40 steam. The new fleet will cost $4,896,000, and be ready for business early the coming season. The largest freight steamers now building have an average carrying capacity of over 500 tons greater than that of the largest steamers under construction a year ago. Contracts for freight thus far for the coming season are much more encouraging for profits to shipowners than those of a year ago, notwithstanding the increased tonnage.

SMOKELESS POWDERS.

BY A NAVAL OFFICER.

The subject of smokeless powder continues to receive the attention of ordnance experts and inventors the world over. It is at present second to none in importance among matters under investigation in the domain of gunnery, because questions of gun construction, armor and tactics will be directly effected and possibly revolutionized to a certain extent by the discovery of a satisfactory form of smokeless powder. The experiments which have during the past few years been made in the way of testing the new high explosives which contain such terrible forces have been watched with unflagging interest by governments everywhere, and in some instances as much secrecy has been thrown around them as though the fate of a nation hung in the balance. It is almost impossible to conceive of compounds having the titanic strength which some of the latter discoveries are said to possess, and yet as the question is only one of degree, it would not be surprising if, in a very short time, even these destructive elements should have to give place to something infinitely more deadly.

The term "smokeless" is, of course, relative, all the new powders actually giving out light puffs, quickly dissipated, and attention has been directed to the different colors of this vapor, as it is held that some are very much less likely to betray the position than others. It would seem, however, as far as this particular is concerned, that the landscape, background and atmospheric conditions would all enter into the question, and that what might answer under certain circumstances would hardly do under others.

The force of smokeless powder is much greater than that of ordinary gunpowder, because of the high explosive character of the substances used. Its combustion is so rapid that 1 grain more than the normal charge of a cartridge will cause a very considerable increase in the pounds pressure to the square inch in the chamber of the gun. Some of the powders look like broken pieces of shellac in fine splinters of irregular size; others like pieces of string, bits of discolored paper and other innocent things. It cannot be measured accurately by bulk, and to get uniform results the amount put into each cartridge must be weighed, thereby increasing the difficulty and cost of putting up ammunition.

Experiments that have been carried on with several varieties of smokeless powders show that while most of those tried were satisfactory as to comparative smokelessness, energy and completeness of combustion, they were not able to retain their normal qualities a sufficient length of time—owing to changes of temperature and atmosphere—to make them of practicable value under the varying conditions of service afloat.

The details of the trials of the most noted smokeless powders are not yet sufficient to show to what degree the ballistical formulæ of ordinary powders will have to be modified in order to enable us to represent the action of the new powders now in use in foreign countries. An approximate idea of the relative values of some of these may, however, be obtained from a comparison of the work done by projectiles, in guns of the same calibre, with charges giving equal chamber pressures. Such methods would be exact if the weight of the projectile, density of loading and the travel of the projectile were identical; but up to the present these conditions have not been obtained absolutely.

The following experiment illustrates the relative power of smokeless and ordinary powder, the gun used being a Hotchkiss 33-pounder:

Powder.	Weight of Charge.	Muzzle Velocity.	Chamber Pressure per sq. in.
Smokeless..	6.8 lbs.	2,215 ft.	15¼ tons.
Ordinary...	13.2 lbs	1,906 ft.	15½ tons.

From this experiment, which is one of many, a much higher velocity was obtained with the smokeless powder than was given by nearly double the weight of ordinary powder, and the pressure in the gun was slightly less with the former. Smokeless powder is so much lighter than ordinary powder that the chamber of a gun will not hold as great a weight of the former as of the latter, but it is not necessary nor desirable that it should.

Another great practical advantage of smokeless powder is that upon burning it leaves little, if any, residue, the combustion is complete. With ordinary powder, on the other hand, it has been found that the solid and liquid residue remaining after the charge is burned is of very appreciable volume. Herein is a loss of power, since energy is absorbed in giving velocity to this residue –firing it from the gun—and considering its weight the loss of power is considerable.

Now, with the new powders there is no residue to be fired from the gun, absorbing and wasting power, and what is more important still, the space behind the projectile increases as the powder burns, even before the projectile moves from its seat, and thus, with smokeless powder, the maximum pressure may be less, since the gases in the beginning have more room to expand. The pressure of a gas varies inversely as the volume. Evidently, then, the powder that leaves no residue permits a greater space for the expansion of the gases in the bore, and proportionally diminishes the maximum pressure. Another superiority claimed for smokeless powder is that it may be made to burn more progressively—that is, the shape and size of grain may be so determined that equal volumes of gas will be given off in equal intervals of time as the charge burns. This would result in making the pressure nearly uniform all along the bore of the gun, diminishing the pressure at the chamber and increasing it at other points, a result most desirable, as guns can be more easily manufactured to resist the force of powder if the maximum pressure can be reduced. It is thought that the ideal gun—a perfect cylinder—will be forthcoming when a perfectly progressive powder is discovered.

When France adopted a smokeless powder for use with the Lebel rifle, some seven years or so ago, and succeeded in keeping its composition secret, many of the principal governments of the world started separately on a series of experiments, with the object of discovering a similar propellant. As far as can be ascertained, all the smokeless powders now in use are surmised to be either nitro-compounds or picrates. Those which have nitrate of ammonia as a base are quite sure to be deliquescent, and require to be kept in sealed cases.

Fortunately, the use of fixed ammunition renders this possible with small arms and rapid-fire guns, but even under such circumstances these powders are very liable to change, and to develop varying pressures, when exposed to high temperatures for any length of time. In the magazine of a vessel stationed in the tropics this would be a source of anxiety, for any change in the composition, even if it did not result in the development of dangerous pressures, would render unreliable the sights of all guns for which the powder was intended. Experiments are being carried out looking to the production of a coating for these powders which will render them insensible to atmospheric conditions.

England finds that cordite comes nearer her ideas as to what a smokeless powder should be than anything else that she has tried. It takes its name from the form in which it is made. It is composed of ordinary blasting gelatine, with soluble nitroglycerine added, and with a solvent sufficient to give it the consistency of thick jelly. This is pressed through holes to form cords, which at first are soft and pliable, but which become toughened after the evaporation of the solvent. Then these cords, which are either of a square or circular cross section, are cut to the necessary lengths and packed side by side in cartridge cases. It is chocolate brown on the outside, but when broken shows a light gray section much like fine-grained pumice stone.

The reputation of cordite and its use in magazine rifle cartridges seems fairly well assured. A very good proof of its durability in different climates is to be found in the fact of its having undergone experiments in India that have been attended with such satisfactory results that if a more extended trial of the climate makes an equally favorable showing it is proposed establishing factories in that country for its manufacture.

That the Italians are satisfied with the result of their experiments with their ballistite is made evident by the fact that up to the present time they have accepted over 1,000,000 pounds for service use, and have adopted and introduced it in the land service for field and mountain guns. It is a preparation containing nitro-cellulose, nitro-glycerine and camphor, to which, during mixture, benzole is added to aid solution and afterward evaporated. This powder gives constant and tempered velocity, is not deliquescent, stands a high temperature without deterioration, leaves but a slight residue and is nearly smokeless.

The Maxim powders have been tried in Europe with reported excellent results. A general idea of the process employed in its manufacture is contained in the following: A quantity of high-grade gun cotton is reduced to pulp and washed to remove any free acid. It is then dried, moistened with acetone and subjected to the action of a mixture of six parts of ether to one of alcohol, until it is partially dissolved. When sufficiently softened it is either compressed into sheets under heavy pressure or else forced through disks to form cords or strips. If the powder is found too quick-burning, substances having a tendency to reduce the rate of consumption are mixed with the gun cotton.

The famous "straw powder" or Hengst powder, as it is generally called, is made preferably from oat-straw pulp, treated with a mixture of two parts by weight of sulphuric acid to one of nitric acid for from 15 to 20 hours, after which the acid is strained off and the pulp washed in water until no trace of acid remains. The mass is then steeped in a solution of hyposulphite of soda or other suitable alkaline solution and then slowly dried. After this it is compressed and then formed into grains of any desired shape.

Some interesting experiments have been made with this powder to show the little effect that dampness has upon it. Two ounces were soaked in water for 48 hours and then dried; when fired, it was found to have been uninjured. A similar quantity was then boiled for 40 minutes and then thoroughly dried; when fired it also was found to have remained uninjured. Two ounces were then steamed for 20 minutes on a copper-wire gauze and alongside of it was the same amount of black powder; without drying the two were fired separately. The Hengst powder exploded, but rather slowly, while the black powder only fused.

These are only a few of the new foreign powders, but they show what giant strides

have been made since the matter was first brought to public notice. Among powders that should be mentioned are the various Nobel powders, the French Poudre B, the B N, the Grakrut of Sweden, Libbrecht powder from the Wetteren factory, the Austrian Schückher, Rhenish-Westphalian, Chilworth special, Schwab's and Gelbite.

The last is the invention of Dr. S. H. Emmens and is obtained by treating specially prepared paper with emmensite, which is composed of nitrated carbolic acid, nitrate of soda and nitrate of ammonia, and is of yellowish color and crystalline appearance. When fired from revolvers and rifles this powder gave off a slight dusty puff, which was very quickly dissipated, and which was acccompanied by a sharp, quick report. It is said that a charge of 25 grains of this powder gives the same propulsive force as 70 grains of ordinary powder.

An army laboratory has recently been established at the arsenal at Frankford, Pa., for the development of government ideas and for experiments with samples of powder and explosives submitted by private inventors, the sole object being to get the articles which native talent can produce. Numerous experiments have shown that of all brands thus far submitted that made by Mr. Haughton of Massachusetts is by far the best. This powder gave results surpassing the very best of the foreign inventions.

In his annual report Commodore Folger, Chief of the Naval Ordnance Bureau, states as his belief that within a very short time the use of the older kinds of gun powder will be entirely abandoned in guns of 6 inches caliber and below, and that they will be replaced by some one of the numerous forms of so-called smokeless powders. This opinion is largely based upon the remarkable success that Commander Jewell and Professor Munroe have met with in their extensive experiments that have been conducted for the past few years at the Government Torpedo Station at Newport, R. I., of which Commander Jewell is in command. The qualities in addition to smokelessness which it has been sought to combine in this powder have been: *a*, progressive rate of burning to insure high initial velocity without undue strains; *b*, complete physical and chemical homogeneity, so that charges of equal weight will always produce the same ballistic effects under the same circumstances; *c*, permanency, so that the powder will not deteriorate while stored or when subjected to changes of temperature.

The three qualities have not been satisfactorily attained in any one of the foreign powders. Particularly is this so with the quality of permanence, and this is due to the use of substances which are unstable at all temperatures, or to the addition of a volatile constituent which, by its evaporation, changes the constitution of the powder. To secure this highly desirable quality the materials used at Newport are carefully purified. The finished powder—a dense, hard mass, not firable, and entirely structureless—contains no unstable nor volatile constituent. Repeated heating for prolonged periods has no apparent effect upon it. Although it will not burn when wet, it is not permanently affected by water, even by boiling in water. A sample was subjected to the action of a mixture of ether and alcohol for five weeks without change, though this solvent has broken down all other smokeless powders subjected to its influence.

In testing this powder with 3-pounder and 6-pounder rapid-fire guns, the former with a charge of 310 grams gave 2250 feet initial velocity, with a chamber pressure of 14.8 tons. The service charge of black powder, 700 grams, gave 2000 feet of initial velocity with a pressure of 15 tons. With the 6-pounder a charge of 400 grams gave an initial velocity of 1960 feet per second with a chamber pressure of 16 tons. The service charge of black powder is 820 grams, which gives a velocity of only 1800 feet with 15.5 tons pressure. The powder is almost entirely smokeless, giving off only a slight haze, which is quickly dissipated. As with European powders, a small priming charge of black powder must be used, as the smokeless powder grains are difficult of ignition. The extreme regularity, uniformity and correspondence of velocities with pressures which were apparent throughout the various tests to which this powder has been submitted are considered as very favorable and highly satisfactory.

Considerable trouble has been met with abroad in the matter of a durable metal for cartridge cases. It has been found that the new smokelesss powders corrode and eat through the copper shells of the cartridges in which they are packed. Various suggestions have been adopted to overcome this difficulty, but nothing was found to answer the purpose satisfactorily until Germany tried aluminum. This, while resisting the corrosion, has the additional advantage of being lighter than any of the other materials tried; a very serious consideration where a large amount of ammunition is to be transported.

The introduction of smokeless powders has had considerable to do with a change of tactics on the field of battle. In the absence of the smoke screen on both sides the company officers not only find it easier to work together, but can control their men and judge the effect of their fire on the enemy to a far greater degree than was formerly possible. From their point of view this increased power of control more than compensates the attack for the increased facility of concealment smokeless powder confers on the defense. It is true that the latter also profits by the same increased power of control, but they argue that from the nature of things the defense striving only to prevent being beaten, whereas the attack fights with the determination to win, the latter is in a position to make far better use of this new power than the former. Put in another form it comes to this—the heavier and more accurate the fire whistling over a trench the harder it is to make men raise their heads over it to take aim. Smokeless powder makes it easier for the attack to deliver such a fire; hence the difficulties of the defense will be increased.

Further, in the absence of smoke, men stationary on the defense cannot escape the depressing influence of the dead and wounded lying around them, but the attack leaves all these evidences of the fight behind it. So here again the advantage is on its side.

With reference to the question of the use of smokeless powders by the artillery the general idea seems to be that it was all a gain to the side which thought more of killing its enemy than of avoiding being killed itself. It enormously facilitates the maintenance of fire discipline within the battery, permits of continuous fire even at the most rapid rate, for no smoke interferes with the laying of the guns, and above all things, cheers the hearts of the men by enabling them to see the results of their fire.

As a means of concealment it is of no use at all, for even at extreme ranges of 5000 yards and upward, the flash of discharge is always distinctly visible, and at fighting ranges the flash enables one to note exactly the position of the enemy's guns. This was not always possible with the old powders, for the smoke obscured the object and prevented one's picking up an exact point to aim at.

The artillery will be far from regretting the loss of the two clouds which hung, the one in front of their own and the other in front of the enemy's guns. Smoke is a cover added to that furnished by the ground, and no one has ever been anxious for his opponent to have covers which he himself could not turn to advantage. If both are deprived of this cover victory will belong to him who, all else being equal, can most skilfully supply the deficiency.

Maneuvers will hereafter probably take place over larger areas before actual fighting begins, and something of an Indian's craft and natural keenness will be needed on the part of staff officers. Smoke has been so good a cover on many occasions that its absence will impose new conditions and natural cover will have to be much more extensively utilized. With the vanishing poetry of the smoke battle the prose of a new era will begin, in which combat will be more like a game of chess in view of the pieces as a whole, and new dispositions of old qualities and virtues will be wanted. Caution will pay in a smokeless combat, enterprise and vigor will win as before, but blunders will receive a terrible punishment fatal to armies and ruinous to nations dependent upon them.

Gathering Tin-Plate Statistics.

Col. Ira Ayer, Special Agent of the Treasury Department, with office at 402 Washington street, New York City, who has been appointed to collect and formulate statistics relating to the production of tin and terne plates in the United States, is sending out a letter to stamping companies and others engaged in the manufacture of articles made from sheet iron or sheet steel, with a view to obtaining records of that part of their product which comes under the definition of tin plates. It will be remembered that a clause in the tariff act provided that the domestic production of tin plates in any one of the years preceding June 30, 1897, must be equal to one third the amount of such plates imported during any of the six years, or otherwise the tariff would be removed. It is therefore necessary to obtain full and reliable statistics of production. The letter recently issued by Colonel Ayer refers especially to the sheet iron and steel of American make which is stamped or otherwise manufactured and then tin or terne plated in this country, and the circular letter from the Treasury Department which he incloses mentions that a suitable book will be prepared by the Department and furnished to manufacturers, who are requested to enter therein their daily production of tin and terne plates of the several classes indicated in it. Colonel Ayer wishes all the manufacturers to obtain copies of these circulars and requests that every concern engaged in stamping or manufacturing black sheets to be afterward tinned communicate with him, so that he may furnish them with this circular, as well as another one that he is about to issue.

The American commissioners, Col. J. W. Weber and Dr. Walter Kempster, who last autumn visited Russia to inquire into the condition and treatment of Hebrew subjects of the Czar, recommend with reference to importations generally that steamship companies should be required to give a bond of not less than $50,000 that such emigrants as may prove, after two years' residence here, to have been landed contrary to the laws of the United States, shall be returned.

The Manchester Ship Canal report states that the receipts from nearly all sources and £200,000 in addition have been exhausted, and £2,500,000 will be required to complete the canal.

THE WEEK.

Western Senators urge that a vast fresh water basin on Puget Sound could be opened from the sea by building a ship canal to a couple of interior lakes, the expenditure to be less than $3,000,000.

A magnificent passenger station to cost $1,250,000 is being planned by the Boston and Albany Railroad for the Back Bay district, Boston.

There are in the United States seven cities having over 400,000 inhabitants and 21 having between 100,000 and 400,000.

The shipbuilding firm, Neafie & Levy of Philadelphia have just completed the sixth steamer for Mendez & Co., to ply between ports on the south side of Cuba. She is a twin screw propeller, 238 feet long and furnished with two compound engines.

An address presented to the Government of British India by the Bengal Chamber of Commerce on the subject of exchange, says it is impossible for men in business to have any confidence in the future value of the rupee, and that there is no complete remedy for the fluctuations in the rates of exchange except by an international system of free coinage of both gold and silver at fixed rates or the adoption of a gold standard by India.

The last run of the steamship Majestic, which reached New York 24th ult., while not a record breaker as to the absolute time between the two continents, nevertheless showed the fastest time ever made on the ocean, the average speed being 20.41 miles per hour.

Reports have been started that clubs of Cuban refugees in New York, Key West and Tampa, dissatisfied with the Government of the island, are planning another revolution. On the other hand, agents of the steamship lines are ignorant of anything of the kind, and a Wall street man who has large interests in Cuba and has just returned from a visit to his estates represents that the island in all respects is in better condition than before for many years. The sugar crop is unusually large; the big estates have been divided and are well cultivated, and money is more evenly distributed.

The power house of the Metropolitan Traction Company, at the corner of Broadway and Houston street, will cost about $1,500,000, and the two other power houses, together with the cost of new rails, paving and general equipment, will bring the total investment in the new cable up to between $5,000,000 and $6,000,000.

A report comes from the Congo Free State that the railway building around the falls will not be ready for at least five years, on account of the incompetency of laborers.

The army ordnance officers will receive offers from manufacturers of magazine guns up to June 1. No foreign-made gun has yet received their entire approval.

Violent mobs of unemployed men in Berlin call upon the Government to protect the interests of the working classes. The building trades are affected by recent strikes.

The Maine ice crop, usually good for 1,500,000 tons, is reported much below the average,

At a meeting of representatives of American republics held in Madrid, 23d ult., the subject of reciprocity with Spain was introduced, and is said to have been well received.

Secretary Foster, before leaving for Europe, said: "The Department would not hesitate to use all means at command to maintain a gold standard, and there was no good reason for any fear of financial disturbance at this time."

The aggregate population of our principal lake cities, scattered among eight States, from New York to Minnesota, exceeds 26,000,000, an increase of 8,500,000 during the last two decades.

The "whaleback" builder, Alex. McDougall, says: "If our lake shipbuilders could bring their ships to the coast without difficulty they would soon be selling them to the English."

The improvements near Fond du Lac on the St. Louis River contemplate ten dams, together having a hight of 124 feet, and the calculated average horse-power is 72,800.

An announcement was made from Harrisburg that the Attorney General of Pennsylvania has decided to begin legal proceedings against the Reading Company for violation of the State Constitution in their recent leases and excited some trepidation among the "coalers."

A committee of the Philadelphia Exchange, just returned from a visit to Buffalo, report that in a short time a great increase of the grain trade to that port through Erie may be expected. The idea is to intercept a part of the trade going via Buffalo and the Erie Canal.

The asbestos mines in Quebec are yielding 8000 tons per annum. The largest consumption of this mineral is in the manufacture of "packing" for steam pistons and of "paper board" for the junction of steam pipes and the like.

Surveys have been made for a ship canal to connect Toledo and Cincinnati.

The savings banks of Maine have $50,000,000 deposits, a gain of $2,500,000 for the year.

The recent conference of Canadian commissioners at Washington does not appear to have been altogether fruitless. According to Lord Stanley's speech at the opening of the Dominion Parliament an amicable understanding was arrived at respecting the steps to be taken for the establishment for the boundary of Alaska, and for reciprocity of services in cases of wreck and salvage. Arrangements were also reached for the appointment of an international commission to report on the regulations which may be adopted by the United States and Canada for the prevention of destructive methods of fishing or pollution of streams, and for establishing uniformity of close seasons and other means for the preservation and increase of fish. A valuable and friendly interchange of views respecting other important matters also took place.

The wells dug in French Algeria have made fruitful no fewer than 12,000,000 acres of barren land, so that the country is becoming famous for the products of its vineyards.

On January 5 last the total revenue receipts of the Argentine Republic for the year 1891 were published, from which it is seen that the amount received from customs was $14,800,000 gold and from sundries $4,400,000 gold, a total of $19,200,000, while the expenses of the various departments of the Government, estimated at the same rate of gold, reached a total of $19,810,000, a deficit of about $600,000 gold, which is considered a most favorable showing in view of the recent crisis in that country.

What is known as the Sullivan bridge bill, fostered by one of the elevated railroad companies in Brooklyn, has passed both branches of the New York Legislature and gone to the Governor for his signature. It is charged that it creates a corporation free from taxation, and that the franchise at public auction would bring $250,000. The capital named is $25,000,000.

Announcement is made that the famous Oroya road, in Peru, built by the American engineer Henry Meiggs, has been extended to Port Tucker, and is now complete, bringing an important part of the coast into communication with Callao.

A 14-story office building will be erected by the Manhattan Life Insurance Company on the three lots north of the Consolidated Exchange, on Broadway.

A steamship line has been arranged to run from Portland, Ore., to Vancouver, to connect with the Canadian Pacific and line to China.

Another grain blockade is announced, this time in Kansas.

The abundance of the new cotton crop baffles all calculations. The official estimates have been moved up to 8,000,000 bales, but already the amount in sight is 440,000 bales larger than it was at the same date last year, when the crop reached the unprecedented figure of 8,650,000. All signs point to another phenomenal crop.

A redivision of labor in the United States Treasury Department must take place. Folger died in office, Manning just after he resigned, Windom under tragical circumstances, still well remembered, and now Secretary Foster is compelled to seek a respite in Europe.

The National Industrial Conference at St. Louis adopted a crazy platform, which demands, among other things, free and unlimited coinage of silver; the increase of the circulating medium to not less than $50 per capita; a graduated income tax; postal savings banks; Government control of telegraphs and telephones and railroads; reclamation of public lands for actual settlers, &c. And Terence V. Powderly indorsed it.

The Leechburg Foundry and Machine Company of Pittsburgh whose plant is located at Leechburg, Pa., have closed a contract with the New Castle Tin Plate Company of New Castle, Pa., for the erection of their tin-plate machinery. The plant will contain four 22 inch sheet mills, three 20-inch cold roll mills and one 22-inch bar mill. Contracts for the engines and other appliances have not as yet been let. This concern will manufacture tin and terne plates and will have one of the best-equipped plants in the country. Only the most modern machinery will be used, and they expect to be in the market not later than October 1 next. From the fact that some of the members of the New Castle Tin Plate Company are manufacturers of pig iron, and are also connected with the Shenango Valley Steel Company, who are now erecting a Bessemer steel plant at New Castle, it can be said that the new concern will manufacture tin and terne plates direct from the ore. When in good running order they expect to turn out about 350 boxes per day.

The office of Daniel Ashworth, mechanical and consulting engineer, has been removed from Room 711, Hamilton Building, Pittsburgh, Pa., to Rooms 60 and 61 Shannon Building, 108 Fourth avenue, in that city.

The office of F. G. Tallman, consulting and mechanical engineer, has been removed from Room 712, Hamilton Building, Pittsburgh, Pa., to Rooms 50 and 51 Shannon Building. 108 Fourth avenue, in that city.

The Iron Age

New York, Thursday, March 3, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Future of Foundry Pig Iron.

The admission is made with reluctance, but nevertheless it has to be made, that the man who has been a persistent pessimist for the past two years has been on the right side. The great majority of those who have been called upon to express an opinion as to the course of trade have taken a very hopeful view. Time and time again the prospect of an improvement seemed very bright, and it was exceedingly difficult to find any reason for holding a contrary opinion. It is unnecessary now to rehearse the conditions which have prevailed, as they have been dwelt upon so much that everybody is tired of hearing about them, but the preponderance of argument for certainly the past six months has been on the side of those who took a hopeful view. If mere sentiment ever ruled the course of commerce, or business enterprise waited on the growth of widespread confidence, there would have been a genuine boom long ere this, because these favorable conditions have not only existed, but have grown rankly for a time. Looking back now, it is seen that the only effect they have had has been to stimulate producers to greater activity. They were the last persons in interest who should have been affected, but, unfortunately, they were the very first. In pig iron especially they have effectually succeeded in stifling the slight growth of an improved feeling which manifested itself among consumers last fall when the effects of the crops began to be seen. The question now comes up, is the pessimist destined to be in the right for some time to come, or is there a better day dawning?

The largest manufacturers of foundry pig iron, those whose trade covers the widest sections, and who are in the best position to consider the question broadly, are giving up the expectation of an early improvement in prices. The producers are not inclined to curtail their output, unless forced to do so for repairs or by financial stress. They are not disheartened by the stocks of pig iron accumulating round them, but hope that the advent of spring will bring a sufficient demand to absorb most, if not all, of the surplus. Thus far the sheriff has played a very insignificant part in decreasing production, much to the surprise of those who are closely watching events. The trade so far has been singularly clear of financial embarrassments of any consequence. Contrary to general expectation, the South holds its own in this particular exceedingly well.

The course of the Southern pig-iron producers is really one of the surprises of the period. Recent visitors to that section from the North are expressing their complete conversion from a former attitude of apprehension of widespread financial trouble among Southern furnace companies. A few weak concerns have been forced to the wall, but they have long been known to be financially feeble, and considerably higher prices might not have saved them. But the large and well-established or the smaller and well-managed companies not only stick pluckily to the fight for trade, but they are actually deriving some benefit from the trade depression. It is stated on good authority that never before was such close economy practiced as now obtains among Southern furnace managers. Every possible source of loss or waste is being carefully watched, and the cost of production is being steadily pushed downward, while the efficiency of the workmen is being increased. The South has gone to work manfully to endeavor to realize a profit from the present market value of the pig iron which it has to sell.

This is, perhaps, the best view of the situation for Northern pig-iron producers to take also. It is of no use to repine at present prices and to consider them as temporary, soon to give way to higher values, when everybody can make money and every one will be happy. The problem to be solved is how to accept present conditions as if they were to be permanent, and to regulate the cost of production to conform to this or even a lower basis. Evidently some of the largest Northern makers of foundry pig iron are taking this view of the question, as they are arranging to control as far as possible their own supply of the necessary ores. When independent of fluctuations in the ore market they can more easily make their calculations in advance. Such concerns will have an immense advantage over their competitors who are forced to purchase their entire stock of raw materials. From these developments in different sections of the country it would appear as if the pig-iron trade had, by common consent, struck a reasonably permanent level of low prices. The increase in consumption will have to be very large to cause an upward movement of any importance.

A parallel for the extraordinary increase in the production of iron and steel is furnished by the phenomenal development of the output of the leading base metals. Statistics for spelter and lead issued during the current month by the Division of Mining Statistics and Technology of the United States Geological Survey may be studied with interest. In 1875 our production of lead was 59,640 net tons. Five years later it nearly reached the 100,000 ton mark, being 97,825 tons. That point was crossed in 1881 with 117,085 tons, while 1891 witnessed an output of 202,406 tons, which places the United States far in the front rank of lead producing countries of the world, even taking into account the fact that some of the metal originated in Mexico. In copper we have long been the greatest producers. The manufacture of spelter, although still far behind that of Germany, is progressing at a very rapid rate. In 1882, the first year for which accurate statistics are available, the make was 33,765 net tons. By 1885 it had reached 40,688 tons, rising to 50,340 tons in 1887, and attaining 80 337 tons in 1891, when the greatest jump in any one year was recorded, the product for 1890 having been 63,683 net tons. In base metals, too, we note the same striking features which characterize the condition of the iron trade—an enormous consumption with which the American producers have not only been able to cope, but which they have slightly overtaken. The balance of supply and demand has been quite nicely adjusted, but, unfortunately, there is a slight preponderance on the side of the supply, capacity being excessive. Any falling off in the enormous consumption endangers values in a greatly enlarged industry.

The Movements of Gold.

Unusual interest is manifested in the export movement of gold at the present time, although it is acknowledged that American banks have a surplus of money at the present time beyond any probable requirements, and that the principal banks of Europe are in like manner abundantly supplied. The banks of England, France and Germany are all in better condition in regard to specie than they were a year ago, as appears from the following comparison:

	February 25, 1892.	February 26, 1891.
Gold	$590,073,962	$529,453,111
Silver	305,780,862	296,391,912
Specie	$895,854,824	$825,845,023

The three banks display between them an increase of $60,620,851 gold and $9,388,950 silver. Therefore, the fact does not appear on the surface that Europe as a whole is in pressing need of gold and on that account constrained to resort to "special" transactions, regardless of the rates of exchange, to obtain it from the United States. At the same time, it is conceded that Russian finances are seriously deranged, and that Austria is endeavoring to accumulate gold preparatory to adopting a gold basis for her currency circulation. Consistently with this view Wall street bankers seem to have assumed that the destination of gold shipments now making from New York is one or the other or both of the countries mentioned. The movement does not excite any serious apprehension among business men and there is really no cause for alarm. But some explanation is sought for an occurrence of this kind which takes place despite the fact that an apparent trade balance in favor of the United States exceeding $200,000,000 has been created during the last seven months from the interchange of merchandise. The supposition is not readily credited that a full offset can be found in the return of American securities hitherto

held abroad, although the process of liquidation thus taking place is known to have been very large. Altogether, an amount approaching $4,000,000 has gone out since the present movement begun, and as the rates of exchange at no time have warranted it, the conclusion is reached that Europe is paying a premium. One account, purporting to be on good authority, represents that the German banks are paying a penny per ounce more for gold than the Bank of England. According to other authorities, the constant agitation of the silver question is the primal cause of the disturbance of gold. For example, the London *Economist* of February 13 said:

> The fear that the States are drifting into monetary difficulties has already disorganized the silver market, which is kept in a chronic state of apprehension lest the Treasury should be compelled to dispose of a portion of the enormous stock of the metal it has accumulated. This is the root cause of the extreme weakness of the silver market, and it is a menace also to the stability of the money market, since it is impossible to say to what devices the United States Treasury may be forced to have recourse in its efforts to maintain the parity between gold and silver.

Very true, the Treasury in course of time may feel constrained to resort to unusual devices, and in the same connection are the recent declarations of the British Chancellor of the Exchequer favoring an international agreement on the subject of bimetallism with the design of supporting the price of silver bullion; and the simultaneous departure for England of Secretary Foster is popularly invested with much significance, sufficient to excite many theories respecting the possible outcome of an interview which will presumably take place with reference to the general subject, even if a conference was not specifically prearranged.

In the present state of the public mind the conditions are favorable to attaching undue importance to circumstances of ordinary occurrence, and even Chancellor Goschen's speech and Secretary Foster's European trip are liable to an intrepretation wide of the mark. The exchanges are disturbed and general business is more or less affected in sympathy, although it was inevitable that extraordinary movements of merchandise and a corresponding liquidation of securities, which financiers months ago spoke of as probable, would be attended with more or less disturbance in the monetary world. The single fact that silver bullion is selling at the present time lower than ever before in the markets of the world is sufficient of itself to excite unusual perturbation.

One of the striking features in recent rolling mill design is the growing use of electricity as a power for subsidiary operations. In a recent visit to the works of the Wellman Iron and Steel Company, at Thurlow, Pa., we noted that a billet shipping apparatus was run by a motor, the billets being elevated and distributed automatically along the shipping platform. At the same works an electric crane for loading plates is soon to be built, an interesting feature of which will be that the plates will be picked up by a large electro magnet. The screw gear for the famous large Wellman three-high 34-inch plate mill is operated by a motor, and the ingots are taken out of the heating furnaces and transferred to the roll table by a car, all of whose movements are controlled by motors. We understand that Mr. Wellman is now designing a charging machine which will go even further in this direction. The Pittsburgh Engineering Company are building for the Carbon Iron Company of Pittsburgh a large new plate mill, in which the latest features in the application of electricity for rolling mill work will be adopted by John F. Wilcox, who is making the designs. We understand that among other things, the shear will be run by an electric motor. Electrical engineers are apt to misinterpret the requirements of rolling mill managers. Thus, accustomed to scan closely economy in line wires and insulation for light and traction installments, they fail to appreciate that a rolling mill manager is willing to pay for the very best for short distances, however extravagant it might be for town work. It is becoming quite evident that besides the electric-light plant, our modern rolling mills will have an electric power plant as a part of their equipment.

Legislation Affecting the Marine Boiler.

On January 20 last a bill having the widest significance was introdued in the United States Senates, read twice, and referred to the Committee on Commerce, where it now is. The bill overhauls some of the most important laws governing the action of the Supervising Inspector General of Steam Vessels and proposes changes vitally affecting every builder of marine boilers and every owner of a steam vessel navigating waters under the jurisdiction of the Federal Government. At the present time we shall consider only those sections of the bill bearing upon the pressure permissible in marine boilers and the application of the contemplated alterations.

To determine the pressure for any boiler with a cylindrical shell, multiply one-fifth of the lowest tensile strength of the shell by the fraction expressing the ratio of the strength of the longitudinal riveted joints to that of the solid plate; then multiply this product by the thickness, expressed in inches and parts of inches, of the thinnest plate in the same cylindrical shell, and divide by the radius, also expressed in inches, and the quotient will be the pressure allowable per square inch, provided that all other parts of the boiler correspond in strength to that of the shell and "that in no case shall the working strength of any material be taken higher than one-fifth of the ultimate strength." This establishes, by the last clause, a factor of safety of five for all boilers built after the passage of the bill. The best boilers built according to the law now in force may be allowed a factor of safety of less than four. The change would result in increasing the thickness of plates beyond that now allowable, in order to obtain the greater strength demanded, and would enhance the cost of manufacture and add to the difficulties. To be sure, the advance in cost of marine boilers of the cylindrical type would be all along the line and would influence all to the same degree, nevertheless the effect would be widely felt.

Much can be said in favor of a factor of safety of fire, and at the same time the present methods can be strongly commended by those well qualified to estimate their efficiency. The ostensible aim of this change is to provide for the safety of the public, from which it could be inferred that the passenger on board a steam vessel has been menaced—fortunately, unconsciously—by the boiler, and life and limb imperiled.

We now approach the most essential section of the bill—one of such vast import and aim that we quote it in full: "That all boilers on steam vessels which were built in conformity to existing law at the time and have since been regularly inspected shall be passed for use, provided always that the safe working pressure shall be determined as herein provided, and that in no case shall a factor of safety less than five be allowed." This covers any marine boiler in the United States subject to the inspection laws, and therefore every owner of a steam vessel is interested. Every marine boiler, built in conformity with the present rules and complying in all respects with specifications now in force, must be re-rated and only such a steam pressure permitted as will insure a factor of safety of five. One instance will serve to illustrate all. A boiler was built to carry a pressure of 100 pounds with a factor of safety of four. No matter when or by whom built nor what its present condition, five is the factor of safety now and the allowable pressure must be reduced to suit the altered condition of things. That boiler is, consequently, limited to 80 pounds pressure, and its effectiveness or horse-power is lessened in like ratio. This is the least reduction; in some cases the working pressure would be reduced more. This would inevitably affect the speed of the boat and reduce its earning powers.

It is not possible to even form a rough estimate of the trouble, expense and amount of overhauling this would involve to bring the propelling power to its present proportions. Taking away at one sweep 20 per cent. of the power of the marine boilers of the United States represents an aggregate of mammoth size.

Many well qualified by ability and experience to judge, assert that this particular section is absolutely not needed and that its enforcement would yield no benefits commensurate with the harm and expense involved.

Some of the leading boiler makers of the country have protested earnestly against the passage of the bill, and have offered changes and modifications that would, in

their opinion, correct the faults of the present laws, and do it without the objectionable features and radical alterations contemplated by the bill now before the Senate. We have been unable to ascertain who instigated the proposed measure. It should certainly not be allowed to slip into the statutes without a vigorous protest from ship owners, shipbuilders and boiler makers.

The majority of American producers and consumers of iron will look with indifference, so far as their interests are directly concerned, upon the threatened great suspension of operations in the English coal trade. We are so far below the parity of English quotations that, practically, no important quantities of English iron and steel, in crude or partly finished form, reach us. In the few branches in which we do depend upon foreign material the Germans have long undersold the English. We buy German spiegeleisen and ferromanganese and for the re-export trade take German billets and wire rods. The one single branch in which a fuel famine would cause serious trouble would be tin plate, in which we are only taking the first steps toward independence. No recent occurrence has more sharply emphasized the need of our deliverance from the rule of the Welsh producer. The cessation of work in the English collieries has, however, a broader significance, as an event which emphasizes a general tendency of great importance for the future, for the time when American iron and steel will enter into the world's markets as a competitor, a time which is possibly not so far distant. The past few years have taught that the price of English coal and coke has reached a permanently higher level. It is quite evident that the days are counted when the supremacy of Great Britain as a manufacturer was based on cheap fuel. The coming contest may delay or accelerate that tendency, but it cannot defeat it.

PERSONAL.

C. Snelling Robinson, for some years past chief chemist of the Joliet works of the Illinois Steel Company, has accepted the position of blast furnace superintendent of the Dunbar Furnace Company, Dunbar, Pa.

W. G. Neilson of Philadelphia has severed his connection with the Wellman Iron and Steel Company of Thurlow, Pa.

Joseph C. Platt of Waterford, N. Y., has returned from Europe.

R. H. Boggis, president of the Taylor & Boggis Foundry Company, Cleveland, Ohio, has gone for a three months trip to the City of Mexico and the Pacific Coast.

Robert P. Linderman, president of the Bethlehem Iron Company, left for Mexico last week.

On Saturday, David Williams, publisher of *The Iron Age*, sailed for Cuba.

E. G. Spilsbury of the Trenton Iron Company, is recovering from the accident which he suffered some weeks since. Mr. Spilsbury broke his leg at Charlottesville, Va., and, after spending some days at Washington, was successfully moved to his Trenton home, where he remained for nearly a month.

OBITUARY.

GEORGE D. KELLY.

George D. Kelly of the firm of Pierce, Kelly & Co., the well-known pig iron manufacturers and owners and operators of the Douglass furnaces at Sharpsville, Pa., committed suicide on Wednesday, the 24th ult. No sufficient cause can be assigned for this act, nor has anything been found as yet that would throw any light upon the matter. Mr. Kelly was 48 years of age and leaves a wife and four children. He was born in Cleveland in 1843, but has resided at Sharpsville for the greater part of his life. He first entered the employ of the late Gen. Jas. Pierce and since 1870 has been a member of the firm of Pierce, Kelly & Co., which is the largest pig iron manufacturing concern in the Shenango Valley.

HORACE L. EMERY.

Horace L. Emery, for 30 years a resident and prominent business man of Albany, N. Y., died at Cleveland, Ohio, February 14. When 31 years of age he went to Worcester, Mass., and took a position as office manager with Ruggles, Nourse & Mason, manufacturers of machinery and agricultural implements. In 1849 he went to Albany, N. Y., to take charge of the agricultural implement and seed store of Luther H. Tucker. Afterward he purchased the business and continued it in his own name. Being of an inventive turn of mind he devoted himself to planning improvements in agricultural implements and machinery, and was among the first to invent valuable additions to mowers, reapers and harvesters. After the big fire of 1848 he purchased property at the corner of Hamilton and Liberty streets, and erected the Albany Agricultural Works. His four younger brothers were afterward associated with him under the firm name of Emery Brothers. Among the many inventions of Horace L. Emery was an improvement on the cotton gin, which was of so important a nature that it brought the firm a very large business from the Southern States, and it was the large amount due the firm from Southern debtors that forced them to suspend. The cotton gin invention was patented in England and shown in the World's Exposition of 1862. When Mr. Emery returned from abroad he formed a co-partnership with the late Ezra Cornell of Albany, repurchased the old works, and associating his sons with him, resumed the manufacture of agricultural implements and machinery until Mr. Cornell's death in 1874. Then the business and property was transferred to the executors of Mr. Cornell. Afterward Mr. Emery went to Cleveland, Ohio, and organized a stock company with his sons to engage in the manufacture of his inventions. In 1884 he retired and turned his attention to civil and mechanical engineering. Among his specialties were the improvement of appliances for the utilization of steam and fuel, abatement of the smoke nuisance in large cities and utilization of petroleum as fuel.

JOHN S. KENNEDY.

John S. Kennedy, president of the New York Mutual Gaslight Company, died on the 27th ult., at his residence, 38 East Thirty-sixth street, after an illness of three week. He was seventy-two years old and had lived continuously in this city for 50 years. He was born here. Mr. Kennedy began his business career as a cotton manufacturer, but fire destroyed his property, and as he had been educated as a mechanical engineer he went into the business of building and erecting gas plants. This was in the early days of gas. He was at one time president of the Wheeling and Lake Erie Railroad Company, and also president of the Howe Sewing Machine Company of Bridgeport. He was one of the directors of the Metropolitan Elevated Railroad Company when they were organized.

The Brown Wire-Wound Gun.

A test of the Brown segmental tube wire-wound gun, the principal features of which we have before described, was recently made at Birdsboro, Pa. Although subjected to a pressure of 53,000 pounds to the square inch, the cylinder made to represent the powder chamber of the gun showed not the slightest trace of injuring. The lining tube, the breech plug, the segments, the wire winding and the gas checks were entirely uninjured. and careful star gauging showed that there was no enlargement of the bore whatever.

The test was made with a cylinder 16 inches long, having a diameter inside of 5 inches and an outside diameter of 15 inches. The 5 inch walls were composed of a thin lining tube, 12 segments 3 inches thick, and about 2 inches of wire wound in 31 layers. The cross section of the wire was 0.07 inch square.

The segments, made of the highest quality of crucible steel, formed a core as if a hollow cylinder having an internal diameter of a little more than 5 inches and an external diameter of a little more than 11 inches had been cut into 12 equal longitudinal strips by planes passing through the axis of the cylinder. The 31 layers of wire wound outside of these segments compress them 0.019 inch, giving a compression at the inside of the cylinder of 60,000 pounds to the square inch.

Outside the cylinder, but not supporting it at all, was a steel casing representing the trunnion jacket of the 5-inch gun, now half finished, on this principle. It held a fixed breech plug at the bottom, exactly filling one end of the cylinder, and a similar plug was attached to the cap of the jacket, which, being screwed down, closed the other end of the cylinder. Two pressure gauges were screwed into the inside end of the lower plug, and a vent hole $\frac{5}{16}$ inch in diameter gave access through the center of the upper plug to the powder charge for its explosion by an electric primer.

The cylinder was set on end in an angle of the railroad embankment and the pressure gauges were screwed into place. A charge of 2 pounds of Dupont's spherohexagonal powder was then put into the cylinder with a pinch of fine rifle powder on top to receive quick ignition from the primer. Then the cap was screwed down and the electric wires were connected with the primer in the vent hole.

No reading of the pressure gauges was taken after this shot, as it was intended merely as a warming charge.

The same proceeding was repeated with increasing charges of powder, the weights used successively being $2\frac{1}{2}$, $2\frac{3}{4}$, 3 and $3\frac{1}{4}$ pounds.

After each firing the pressure gauges were taken out and read and the bore was star gauged. There was found to be no change whatever in the diameter of the bore, in spite of the enormous pressures recorded, as follows:

Shot.	Powder charge. Pounds.	Pressure per square inch. Pounds.
No. 1	2	No record.
No. 2	$2\frac{1}{2}$	35,200
No. 3	$2\frac{3}{4}$	42,300
No. 4	3	47,700
No. 5	$3\frac{1}{4}$	53,850

In each case the average of the two gauges was taken. The crusher gauges were those used in the United States army. They are regarded as fairly accurate up to 40,000 pounds—the highest pressure permitted in army guns. It is believed, how-

ever, that above 40,000 pounds these gauges underrate the actual pressure, and that the recorded pressure of 53,850 pounds was really not less than 60,000 pounds to the square inch.

The 5-inch gun now under construction is nearly ready to be assembled and wound. It will be finished and fired in May. As it will have a length of 44 calibers and can be safely given a chamber pressure of 25 tons per square inch, an initial velocity of at least 2700 feet a second is expected. The standard navy 5-inch gun is not intended for a higher chamber pressure than 17 tons per square inch, or for a higher velocity than 2000 feet a second.

Treasury Decisions.

CORRUGATED IRON.

Before the United States General Appraisers at New York, February 1, 1892. In the matter of the protest, 8916 *b*—551, of Gall & Henning Pneumatic Malting Drum Mfg. Company, against the decision of the Collector of Customs at Milwaukee, Wis., as to the rate and amount of duties chargeable on certain perforated iron plates imported per Sorrento, July 30, 1891. Opinion by Wilkinson, General Appraiser.

The goods are iron sheets or plates, No. 13 wire gauge in thickness, 88 inches in length, and 58 inches in width. The plates are thickly perforated with holes, which are in size No. 8 wire gauge on one side of the plate and No. 12 wire gauge on the other.

The merchandise was assessed for duty at 45 per cent., under paragraph 215, N. T., and is claimed by the appellants to be dutiable at 1 cent a pound, under paragraph 142, or at four tenths of 1 cent a pound, under the provision in the same paragraph for corrugated or crimped sheets of iron.

The 1 cent provision in paragraph 142 cover sheets of iron of 13 wire gauge only when the iron is valued at 3 cents per pound, or less.

In the present case we find:

1. That the iron sheets are valued at more than 3 cents a pound.

2. That they are not corrugated nor crimped.

The protest is therefore overruled.

1) WIRE ROPE, GALVANIZED AND WITH JUTE CORE—(2) SPECIFIC VS. AD. VALOREM RATES.

Before the U. S. General Appraisers at New York, February 4, 1892. In the matter of the protest, 11256 *b*, of Upson, Walton & Co., against the decision of the Collector of Customs at Cleveland, Ohio, as to the rate and amount of duties chargeable on certain iron-wire rope imported per Indiana, July 28, 1891. Opinion by Wilkinson, General Appraiser.

The merchandise consists of one coil of sash cord or rope made of galvanized iron wire and one coil of steel-wire rope. Duty was assessed as follows:

1. Upon the sash cord, weighing 172 pounds. This was invoiced at £5 11s. 1d. The value of the wire, No. 26 gauge, was estimated at £4 11s. 1d. This wire being valued at about 12 cents a pound, and the specific duty, 2½ cents, not equaling 45 per cent., duty was assessed upon the wire at 45 per cent. with an additional duty of ½ cent a pound for galvanizing and 1 cent a pound for making into rope.

2. The wire in the steel-wire rope was No. 27 gauge, valued at less than 6 cents a pound. Duty was assessed upon the wire at 45 per cent. ad valorem, with an additional duty of 2 cents a pound for making into rope. The rope contained a tarred jute core, which was separately assessed for duty at 3 cents a pound.

The appellants claim:

1. That if the galvanized iron wire is assessed for duty at 45 per cent. ad valorem, it is not liable to an additional duty of ½ cent a pound for galvanizing.

2. That the jute core in wire rope is no longer yarn or cordage, but is simply a part of the wire rope, and as such is liable only to the specific duty levied upon wire rope.

In regard to the first claim of the appellants, paragraph 148 provides that all iron or steel wire valued at more than 4 cents a pound shall pay a duty of not less than 45 per cent. ad valorem. This provision is in place of the specific rates named in the paragraph when such rates do not equal or exceed 45 per cent. But iron wire galvanized is still iron wire, and when the 45-per cent. provision is resorted to neither the gauge rate nor the ½ cent a pound additional duty for galvanizing is applicable or material.

Steel-wire rope commonly, if not invariably, contains a jute or hemp core, to give the rope pliability. This core is an integral portion of the rope, and is covered by the duty of 2 cents a pound imposed upon the gross weight of the rope in addition to the duty upon the wire.

Both contentions of the importers are well founded, and the protest is hereby sustained.

It is proper to add, for the information of classifying officers, that the ad valorem rates should be applied to wire only when the specific rates do not exceed 45 per cent. In the present case, although the specific rate on the steel wire exceeded 45 per cent., the ad valorem duty was charged.

Union Switch and Signal Company.

At the forthcoming stockholders' meeting of the Union Switch and Signal Company of Pittsburgh, to be held in Swissvale, Pa., where the works of the firm are located, on March 8, it is expected that there will be quite a contest for election to the presidency of the company between E. M. Goodman who is president now, and George Westinghouse, Jr. The Board of Directors of the company recently issued the following circular to the stockholders in conjunction with the request for proxies:

"In March, 1891, the affairs of the company were in great confusion and embarrassment, and notwithstanding dividends had been previously declared, the company's interest bearing unfunded obligations were $478,000. The open accounts payable were about $100,000. Its coupons on its mortgage bonds to the amount of $92,621.47 were unpaid; its patents were held on licenses or royalty, the royalties were in arrears, and the company's notes were out for indebtedness other than that of the company, and worthless accounts for other and alien companies stood on its books. Your common shares were quoted at $7 per share and your preferred stock at $19 per share. The annual fixed salary charges were $64,598.

"Notwithstanding this situation, the present board, under the clear, sagacious and determined management of Mr. Goodman, the president, have reduced the floating interest-bearing indebtedness from $478,000 to $184,709.40, a reduction of $293,290.60; have reduced the annual fixed salary charges from $64,598 to $49,900, a saving of almost $15,000; the open accounts payable to $81,500, a reduction of $19,000; have acquired the absolute title to all the company's patents—a matter of very great value—and procured releases of the royalty contracts and of unpaid royalties.

"While there yet exists an obligation of $93,000 for accommodation to another company, inherited from the former administration, that debt is believed to be amply secured and may and ought to be entirely retired within the coming year.

"Your common shares have increased in market value from $7 per share to $20, almost 300 per cent., and your preferred from $19 to $40 per share, over 200 per cent. All this is the direct result of the careful management of the present administration.

"The new contracts taken for the month of January, and for about one-half of February, 1892, aggregated within $200,000 of the total business of the whole year of 1891. The board believe that should the policy which has prevailed during the year be continued the earnings of the company will speedily place it upon a dividend-paying basis.

"To the end that your will may be known, in the event of your absence at the annual meeting of 1892, we inclose a form of proxy, which, if approved, should be forwarded to E. H. Goodman, president of the company, at Swissvale."

As soon as this statement appeared, it was telegraphed from Pittsburgh to George Westinghouse in New York City, and that gentleman wired instructions to Walter Uptegraph, his private secretary, to issue a Westinghouse circular, a copy of which is as follows:

"*Dear Sir:* I feel that I cannot, in justice to the stockholders and myself, pass without comment the circular issued by order of the Board of Directors of the Union Switch and Signal Company, dated February 25, 1892, a copy of which I inclose for your information. It is true that during the past year, under the active management of E. H. Goodman, substantially the results referred to have been accomplished, but it is equally true that but for the unceasing attention which I have given the affairs of the company, and the financial aid which I have rendered, these results would have been impossible. During the past year Mr. Goodman has repeatedly been obliged to come to me for financial aid in meeting the obligations of the company, and has quite as often stated that none of his directors would help him to raise money for any purpose.

"I think it not out of place to remind you that the members of the present board, themselves holding but a small amount of stock, were elected at the last annual meeting by the wrongful use of proxies intended for me, and that they have continued to hold their positions after having been fully acquainted with the manner of their election. I accordingly do not think that their appeal for proxies should meet with a favorable response on the part of the stockholders.

"A number of influential business men and bankers in Pittsburgh have expressed to me a willingness to become directors of the company, and my request for proxies is simply on account of my desire to have the support of all stockholders in order to elect a board that will strengthen the financial position of the company and actively aid in pushing their business; for without such a board I would not feel justified in continuing to give the company the co-operation and financial aid which it has received from me during the past year.

"I hope you can be present in person, but if not, I would be glad to have you execute and send to me the inclosed proxy (which revokes any former proxy you may have given), taking care to date it and have your signature witnessed.

Yours very truly,

GEORGE WESTINGHOUSE, JR."

It is stated that Mr. Westinghouse feels that he has not the proper representation on the Board of Directors that his efforts in behalf of the company would entitle him to have. The capital stock of the Union Switch and Signal Company is $1,000,000 common and $500,000 preferred, divided into 20,000 and 10,000 shares respectively, or making a total of 30,000 shares. It is stated that the net earings of the company for the past year were about $65,000.

Undocumented Vessels Owned by Citizens.

Federal legislation from the beginning has been adverse to the recognition as a vessel of the United States of any vessel which has ever been, in whole or in part, in the ownership of aliens. A few exceptions have been made, as of a vessel built in this country for aliens, and "recorded" as such. More than that, the statutes have aimed to exclude from our waters, after they have become the property of citizens, vessels which have been in foreign ownership. But the early administrations, apparently with the connivance of Congress, allowed such vessels to sail under a sea letter, as if it were in itself sufficient to justify the navigation of such a vessel. But that is an instrument growing out of maritime usage, cumulatively certifying the ownership of the vessel, the purely commercial character of the voyage, and its freedom from any purpose to aid a belligent in a pending war. In its nature it would be appropriate for one voyage only. In 1810 Congress passed an act to break up the practice, after the 30th of June of that year, except where the privilege has been secured by prescription.

Subsequently regulations were made by the Treasury Department which permitted a bill of sale of an alien vessel to citizens to be recorded at a custom house, and to be returned to the vender with a certificate indorsed thereon of the recording, and of the citizenship of the vender. To such vessels the State Department conceded the right of carrying the United States flag. Upon the arrival of such a vessel in the United States she would be liable to a tonnage duty of 50 cents per ton on the tonnage of the vessel, denominated "Light Money," under act of 1804, now Section 4225 Revised Statutes, but for the act of 1805, now Section 4226 Revised Statutes, which declares her exemption, if she be "in possession of a sea letter, or other regular document, issued from a custom house of the United States, proving such ship or vessel to be American property." Under this state of the law and the practice in the recent case of the yacht Conqueror, tonnage duty was exacted upon her under another section of the Revised Statutes (4219), which levies a duty of 50 cents per ton upon all vessels not of the United States, unless they can show exemption under treaty stipulations. And then the question was presented to the court whether she herself were not liable to duty as an importation of merchandise.

Additional legislation seems to be desirable to establish more clearly the status of such vessels—to ignore them entirely or to recognize them under some plainly defined law, resting on some appreciable distinction in principle. At present such a vessel is *nullius nationis navis.*

Extensive experiments to determine the value of cellulose as a material in the construction of war vessels are to be made by the Navy Department. Cellulose is the material used in France to exclude water from ships that have been penetrated by projectiles. The trials will take place near Norfolk, where a large floating tank with protected lining made of the material is being constructed. The American shipbuilders having contracts for the construction of Government vessels stand ready to use the cellulose as soon as the naval experts shall decide upon its merits. A plant has been established in Philadelphia for its manufacture.

A test is to be made at Fort Wadsworth, N. Y., on the 15th inst., of the Ericsson subaquatic projectile, and of the pneumatic gun carriage, with Seabury breech mechanism. The Army Ordnance Board has made the arrangements, and General Schofield is to be present.

San Francisco News.

From a business point of view, the weather that we have had during the past two weeks has been the most favorable that could have been experienced so far as our agricultural and business interests are concerned. Most of it has been fine, like that of early summer in other lands, but we have had rains sufficient to keep everything in good condition from the point of view of crop prospects. Heavy crops, of course, call for a goodly supply of agricultural implements, of mowers, reapers, &c., and the better the prospects the larger the supplies that will be needed. We have been importing largely of plows, which in due time will give place to something else. Besides this, our establishments at Benicia, Stockton and San Leandro will supply their quota, a steadily increasing one. Business at present is dull and doubtless will remain so for some little time to come.

The nail factory reports that it is working ahead with full force. The base price of nails at present is $2.40 per keg for iron and steel, though a higher rate is quoted. Recent arrivals have been light. The tinplate market continues very dull, and has been constantly declining in price. It is now down to $6 to arrive, $6.10 spot. This is, of course, due to the certainty or almost certainty of heroic treatment being applied to cure the unsatisfactory state of the salmon market. A heavy reduction from the pack of 1891 must be regarded as a certainty. Pig tin has been reduced to 21 cents. The Mariposa brought 1506 ingots of tin.

I have now full particulars of the imports of iron, &c., by rail, and will give a comparison for the past two years:

	1890.	1891.
Agricultural impl'ts	$12,071,740	$10,661,350
Axes	465,410	448,610
Axles	291,430	517,7 0
Cutlery	165,540	106,340
Engines	662,330	822,870
Fire arms	203,430	317,960
Hardware, heavy	3,936,040	4,546,670
Hardware, shelf	4,258,230	4,217,200
Horse shoes	314,720	363,700
Iron, pounds	40,608,430	48,006,780
Machinery, pounds	14,104,600	14,732,670
Nails, pounds	4,633,230	4,790,550
Presses	446,020	313,690
Quicksilver, flasks	980	.....
Railroad material	4,720,050	8,137, 20
Scales, &c	610,920	365, 80
Shovels, &c	740,310	800,730
Steel, pounds	9,824,670	19,994,260
Stoves, &c	7,554,280	8,062,890
Tin plate	458,470	7,693,310
Tinware	668,220	836,730
Tools	487,650	500,230
Wheelbarrows	369,120	347,050
Wire, pounds	7,396,920	12,416,520

During the two weeks just closed our receipts by rail included nine cars of iron, six cars of steel, one of wire, eight of pipe, one of fence wire, two of stoves, five of agricultural implements, one of plows, one of wire rope, one of rails, one of radiators, two of ranges, four of steel plates, 13 of machinery, one of cable, two of plates, two of wire netting, one of scales, one of castings, three of hardware, two of safes, besides 7030 pounds of copper. Total, 67 cars.

Among imports by sea were 500 tons of English pig iron, 108 tons scrap steel plates and 500 tons sheet iron from Europe, besides large consignments of American to Alex. MacCallum.

The United States Supreme Court holds that the bringing of the Rev. E. Walpole Warren to this country under a call from the Church of the Holy Trinity was not a violation of the law which prohibits the importation of laborers under contract.

MANUFACTURING.

Iron and Steel.

Judgments aggregating a considerable amount have been entered against the Iron and Steel Band Company, Limited, of Pittsburgh, whose plant is located at Homestead, Pa. The concern manufactures cotton-tie bands. John Goff, Jr., secretary and treasurer, states that an effort is being made to secure an extension and for this purpose a meeting of the creditors will likely be held during the present week. Mr. Goff says that his firm is able to pay all its obligations in full if given sufficient time.

Julian Kennedy, engineer and contractor, Hamilton Building, Pittsburgh, Pa., has secured a contract for the erection of a 10-ton ladle crane and a 16-ton ingot crane, to be built at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa. Work has already commenced on the new converting department to be erected at this works, for which Mr. Kennedy has also the contract.

In the courts of Youngstown, Ohio, last week, Fayette Brown, receiver of the firm of Brown, Bonnell & Co., commenced an action against the Mahoning Fuel Gas Company. The petition asks for a judgment of $72,600 against the gas company for breach of contract in not supplying the mills with natural gas.

The firm of Strawbridge & Beaver, Limited, manufacturers of tin and terne plates at Kensington, Pa., a few miles from Pittsburgh, has been succeeded by a corporation, to be known as the Pittsburgh Tin Plate Company, with a capital stock of $60,000. The stockholders are W. P. Beaver, Jas. R. Strawbridge, of New Kensington; W. A. Voeghtly and E. B. Voeghtly of Pittsburgh, and Elliot Rodgers of Allegheny.

The new tin plate plant of Wallace, Banfield & Co., Limited, of Pittsburgh, with works at Irondale, Ohio, was put in operation last week. Tin and terne plates will be manufactured, and the concern will also manufacture black sheets, as they have one of the best equipped sheet mills in the country.

W. D. Hofius has purchased the Trinidad Rolling Mills at Trinidad, Col., for $10,000.

A charter has been issued to the Acme Iron Company of Norristown, Pa. The capital is $75 000, and the directors are Isaac McHose, Reading; Edwin R. Mann and Frank Samuel, Philadelphia; Ambrose A. McHose and Wilson McHose, Norristown.

The blast furnace at Rising Fawn, Ga., has closed down and 300 men are thereby thrown out of employment. The mines will be operated to their full capacity, but it is stated that the furnace will not resume until there is a change for the better in the iron market.

The Napier Furnace, at Napier, Tenn., has been put in operation and the first blast was very successful. The furnace has a capacity of 50 to 60 tons per day.

The Howard-Harrison Iron Company, Bessemer, Ala., will increase their capital from $500,000 to $750 000 and enlarge their plant.

It is reported on very reliable authority that another rolling mill plant will be established at Henrietta, Texas.

The Lone Star Iron Company, at Jefferson, Texas, have purchased 25 carloads of machinery at St. Louis, Mo., for their steel plant and rolling mill.

The rolling mill of the Roanoke Iron Company, at Roanoke, Va., has begun operations. Eleven of the 15 furnaces have been fired up. When the finishing mill is completed this will be one of the largest industries of the kind in the South.

The Buffalo Steam Forge Company of Buffalo, N. Y., have gone into the hands of a receiver. The liabilities are $61,681, and the assets $24,633. The capital stock of the company was $25,000. The company were organized in 189 for the manufacture of car axles and railroad forgings.

A contract is reported to have been signed with the Cleveland Axle Mfg. Company of Cleveland, Ohio for the removal of their entire plant to West Pullman, near Chicago. This is the second largest concern manufacturing steel and wrought-iron wagon and carriage axles in the United States. From 200 to 300 men will be employed. The buildings to be erected at West Pullman will be a machine shop, 300 x 60 feet; forge room, 240 x 60 feet; warehouse, 80 x 50 feet; foundry building, 80 x 50 feet; boiler room 25 x 50 feet; pattern room, 25 x 25 feet. Construction will commence within the next ten days. The site is the southwest corner of 121st and Peoria streets in the manufacturing districts.

The new plant of the Penn Steel Works, at Chester, Pa., is being erected at a rapid rate. The incorporators of the company have applied for a charter under the title of the Penn

Steel Casting and Machine Company. The dimensions of the new steel foundry will be 225 x 100 feet.

The Troy Steel and Iron Company had intended to shut down the Bessemer Steel Works, at Troy, N. Y., on the night of February 27, but this event was hastened by the breaking down of one of the rolls Friday night, February 26. The works will probably be shut down for two or three weeks. A suspension of work is rendered necessary by a combination of facts. Repairs are absolutely necessary, and furthermore, the surplus supply of pig iron is exhausted, and the output from the furnaces is less than the consumption.

The Wellman Iron and Steel Company, manufacturers of plates, at Thurlow, Pa., have broken ground for two additional 20-ton open-hearth furnaces. An additional heating furnace for the large plate mill will also be built at an early date.

The Pennsylvania Steel Company, Steelton, Pa , whom we noted a few weeks ago as having put a steam-hydraulic Ridgway crane at their No. 1 blast furnace for handling the cinder, have determined to use the same system at some of their other departments and have ordered for their bridge and construction branch a steam-hydraulic of 15 feet lift and 36 feet radius, which will be used for loading bridges and handling material.

Isaac G. Johnson & Co. of Spuyten Duyvil, New York City, are doubling their capacity for making steel castings, especially shot and shell for the Government. In their new foundry they are introducing two Ridgway 5-ton cranes.

The Southern Malleable Iron Company, Chattanooga, Tenn., are erecting an addition to their plant 100 x 50 feet.

It is announced that the Pine Lake Furnace, at Ironton, Mich., will resume operations during the coming summer.

The Woodstock Iron Company Anniston, Ala., are getting in stock and preparing to blow in No. 3 Furnace about April 1.

At a recent meeting of the Fort Payne (Ala.) Furnace Company, the following directors were elected: R. W. Gordon, C. S. Abbott, J. A. Wilder, G. E. Lathrop, E. D. Freeman, W. A. Jencks, A. H. Layles. The total cost of the furnace to date is $130,000, and they have a paid-up capital of $100,000, with bonds sold to date of $28,600. There is only a small debt remaining, and it hoped to get the plant in operation at an early day.

The Montgomery Furnace at Port Kennedy, Pa., which has been greatly improved, is putting in a Ridgway steam-hydraulic crane for loading the cinder. This machine will save them over $1000 per year in wages of handling the cinder alone.

In regard to reports which have been recently circulated to the effect that large reductions have been made in the wages paid to nailers employed in the various mills at Wheeling and elsewhere, we can state that all the nail factories in the Pittsburgh district are being operated under private arrangement with their men as regard wages to be paid for cutting nails. While it is true reductions have recently taken place at one or more mills, the men have no recourse in the matter, as the fact that they are working under private arrangement with their employers prevents any action being taken by the Amalgamated Association. It is stated that several factories have a very desirable arrangement with their men, and are able to undersell competitors in the market on account of the low prices they pay for nail cutting.

Shelby Steel Tube Company of Shelby, Ohio, have recently completed a new brick building 31 x 100 feet, a new frame building 31 x 100 feet, and are now putting the finishing touches upon a brick building 100 feet square. A warehouse 50 x 80 feet is also going up, and as soon as the weather will permit, the company will commence the erection of another new rolling mill building 80 x 100 feet. They have now in operation seven benches, turning out a product of from 2000 to 3000 feet of tubing per day, have placed an order for six more additional benches and anticipate, by June 1, to increase this to at least 20 more, giving them a total capacity of 33 benches. The company have also placed an order for another pair of double engines and two rolling mills. They now employ 75 men.

Mill No. 5 of the Reading Iron Works, Reading, Pa, which has been idle for some time, resumed operations on Monday morning, the 29th ult. The mill will run on double turn and give employment to about 300 men.

A number of executions have been filed against Pierce, Kelly & Co., owners and operators of the Douglass Furnaces, at Sharpsville, Pa. The concern is indebted to the First National Bank of Youngstown in the amount of $21,000. Undoubtedly the cause of the financial troubles of this concern is directly traceable to the long and severe depression of the pig iron markets. The blast furnace plant of this firm is a well-equipped one, and under favorable market could be operated at a profit. As yet no action has been taken looking to the shutting down of the furnaces.

Two executions aggregating over $12,000 in amount have been filed against D. W. C. Carroll, mechanical engineer, of Pittsburgh. Several years ago Mr. Carroll was identified with the Carroll-Porter Boiler and Tank Company of Pittsburgh, but severed his connection with that concern about the time the plant was put in operation.

Machinery..

The new engine works of Wm. Wright, at Newburg, N. Y., have been formally opened. The new plant is a model establishment in every particular, and in it the production of the well-known Wright steam engine will be largely increased. The works are admirably situated on the bank of the Hudson River, on which they have a frontage of 500 feet, and the main tracks of the West Shore Railroad pass directly by them. A pier with a frontage of 205 feet and a depth of 350 feet has been built, so that the facilities for transportation both by water and rail are of the best. The main building is 400 x 100 feet, and contains the machine shop, which is 200 x 100 feet, or occupying half the structure, the other half being equipped as a foundry, with a clear floor space of 75 x 100 feet. A 100-horse-power Wright engine and its boilers occupy the intervening space between the foundry and machine shop. The smith shop, pattern shop and storerooms occupy a separate building 150 x 50 feet, two stories high. An office building, 30 x 40 feet, adjoins the works. A boiler shop will shortly be added to the plant. The buildings are of brick and constructed in the most substantial manner possible, while the equipments are such as have been suggested by Mr. Wright's long experience as an engine builder, a good portion having been made in his present works.

The Fort Worth (Texas) Iron Works Company have doubled their capital stock, making the stock of the company, fully paid up, $100,000. At the last meeting of the Board of Directors John F. White was elected superintendent and manager.

Among the latest charters at Harrisburg, Pa., are the Penn Steel Castings and Machine Company of Chester; capital stock $150,000, and Ajax Iron Works, Corry, capital stock $60,000.

The Maxon Detachable Steel Chain Belting Company, capitalized at $50,000, have been incorporated at Dayton, Ohio, for the purpose of manufacturing chains, link belting and link-belting machinery.

W. B. Pollock & Co., proprietors of the Mahoning Boiler Works, at Youngstown, Ohio, manufacturers of boilers, tanks and plate iron, are filling large orders for shipment to Great Falls, Mon. and San Francisco, Cal. The firm are also doing considerable heavy work for Carnegie, Phipps & Co., Limited, of Pittsburgh, Pa.

A number of puddling furnaces in the puddling department of the plant of J. Painter's Son Company, at Pittsburgh, were closed down for an indefinite period last week on account of the depression existing in the iron trade.

The Ohio Machine Tool Works, William Lodge, proprietor, is the name of a new concern which will start up March 1, 1892, at Cincinnati, Ohio, occupying the premises formerly operated by the Walton Architectural Iron Works, corner of Harrison and Culvert streets, measuring 80 x 96, three stories high. The new concern have purchased the property in question, and have expended something over $5000 for new machinery adapted for the production of special iron-working tools that will cover a wide range of work.

A number of business men of Randolph, N. Y., are completing arrangements for establishing a foundry and machine shop in that village.

The Birmington (Ala.) Bolt and Nut Works have been incorporated by R. D. Johnson, J. H. Johns and Smith M. Evans. The capital stock is $5000, and they will manufacture bolts and nuts.

J. T. Hall of Greenville, Mich., will establish a plant at Lenoirs, Tenn., to manufacture steam engines and saw mill machinery.

E. R. Weidman & Son of Unadilla, N. Y., are preparing to erect a machine shop at Harriman, Tenn.

National Pipe Bending Company, New Haven, Conn., are now occupying their new factory, which is in full operation, using Thomson Welding Company's machines for electric welding of coils, which enables them to fill orders more promptly than heretofore. They report 500 heaters, aggregating 50,000 horse-power, sold during 1891, and in the ten years of their existence have sold nearly 500,000 horse power. They have on hand orders for about 200 coils and National Feed-Water Heaters from 1000 horse-power down.

The Campbell-Zell Company have leased and will operate the Ramsey Iron Works at Baltimore, Md.

The Youngstown, Ohio, Foundry & Machine Company have delivered to the Mahoning Valley Iron Company two chilled rolls, each 24 x 50, of an aggregate weight of 8½ tons, for use in their sheet mill. The plant of the Youngstown Company is shortly to be enlarged to meet the demands of increased trade.

It is stated that the San Francisco Railroad will erect shops at Fort Smith, Ark.

The Schuster Foundry Company have been organized at South Pittsburg, Tenn., to manufacture coil pipe under patents of L. Schuster of Philadelphia. The company have already commenced operations in temporary quarters and will at once erect a building 80 x 200 feet. Forty workmen are now employed, mostly skilled labor.

The Florida Central and Peninsular Railroad Company will remove their shops from Tallahassee to Fernandina, Fla.

The Mount Carmel Pulley Company will establish works at Kokomo, Ind.

At a meeting of the Board of Directors of the Westinghouse Air Brake Company of Pittsburgh, held there last week, an extra dividend of 5 per cent. was declared, payable to stockholders of record on March 1. Besides the profits from the manufacture of their air brakes, the company have a large revenue from their investments, notably in the London Air Brake Company, Limited, who recently increased their dividends to the rate of 20 per cent. per annum.

Hardware.

The Brass Goods Mfg. Company, Brooklyn, N. Y., have recently moved into larger and more convenient quarters at 86 to 92 Third street. They now have all their machinery on one floor, which obviates the necessity of hoisting the material and of lowering the finished goods, as was the case in their former location. The factory is heated by steam, with light on three sides. They have in course of preparation drawer, till, cupboard and chest locks, which combine new and desirable features. Their New York office and salesroom are continued at 88 Chambers street.

Spring Curry Comb Company, South Bend, Ind., advise us that they are running their factory day and night with a largely increased force, to supply the demand for their spring curry combs. They are now planning such additions to their facilities as will, when completed, enable them to execute orders more promptly than they are now able to do.

The American Casket and Hardware Company of Westfield, Mass., have elected these officers for the ensuing year: President, James A. Lakin; vice-president, O. B. Parks; secretary, E. L. Peck; treasurer, W. H. Whitney. These officers, with R. B. Crane, James Noble and George Moulton, constitute the Board of Directors.

Manhattan Silver Plate Company, Lyons, N. Y., with sales rooms at New York, Philadelphia, Chicago and San Francisco, state in a circular letter to the trade that the year 1891 has been one of remarkable success in their business, and although their output has been the largest in the history of the company they were unable to fill their orders as promptly as they desired. They have added largely to their facilities in all departments, and it is their intention to still further increase them for the coming year, both by new buildings and the employment of a larger force of expert artisans, together with new machinery.

The mammoth set of chimes being cast by the Meneely Bell Company of Troy, N. Y., for St. Patrick's Cathedral, New York City, are nearly completed. There are 15 bells. The largest weighs 6600 pounds, and the smallest 250. The combined weight of the set, with the frame in which they will rest, is nearly 40,000 pounds.

Wickwire Bros., Cortland, N. Y., have filed a certificate of incorporation. The capital stock is $300,000. The following are the five directors and sole stockholders: C. F. Wickwire, T. H. Wickwire, A. F. Stilson, Edward Stilson and E. V. Wickwire.

The Standard Cycle Company of Binghamton, N. Y., composed of C. E. Titchener and W. H. Dillon, have purchased the stock and business of the E. H. Towle Cycle Company. They are now in shape to receive orders for bicycles, sundries, &c. The company are agents for the Victor, Columbia and Hartford wheels. W. H. Dillon, who will have general charge of the business, is an expert mechanic and will do all kinds of bicycle repairing.

Miscellaneous.

At a meeting of the Board of Directors of the King Iron Bridge and Mfg. Company of Cleveland, Ohoi, it was decided to increase the capital stock to $1,000,000 and shorten the name of the corporation to "The King Bridge Company."

Captain Childress states that the plant of the Harvest Stove Company at South Pittsburg, Tenn., will be in operation within 90 days and that he has assurances from the officials of the Tennessee Coal, Iron and Railroad Company that they will commence the erection of their steel plant during the coming spring.

The Columbian Metallic Rod Packing Company of Philadelphia, capitalized at $150,000, have been chartered.

A company has been organized at Upper Sandusky, Ohio, with a capital stock of $100,000, for the purpose of manufacturing fuel and illuminating gas plants.

The Johnson Company of Johnstown, Pa., manufacturers of street railway appliances and steel castings, find the demand for the latter so great with them that they are obliged to again increase their capacity. They have been using for the past three years two 5-ton Ridgway steam-hydraulic cranes, and are now placing a 10-ton crane of the same sort.

Among recently authorized corporations in Illinois are the following: The American Hydraulic Dredging Company, Chicago, to manufacture and operate machinery for deepening waterways, harbors, &c.; capital stock, $250,000; incorporators, Charles Lacey Plumb, Robert L. Tatham and Charles R. Webster. The Stevens Mfg. Company, Peoria, mill and elevator machinery; capital stock, $700,000; incorporators, L. O. Stevens, Valentine G. Hietter and William O. Edwards. Havana Mfg. Company, Havana, agricultural implements; capital stock, $40,000; incorporators, Isaac N. Mitchell, Newton C. King, John W. Rhodes and Wells Purdy.

Among contracts which the Berlin Iron Bridge Company of East Berlin, Conn., have on hand are an iron building 52 x 170 feet for the Chester Pipe and Tube Company, at South Chester, Pa.; a boiler shop 68 x 201 feet and a machine shop 72 x 184 feet for the Dry Dock Engine Company, at Detroit, Mich.; a boiler shop 115 x 370 feet for the Wm. Cramp & Sons Ship and Engine Building Company, at Philadelphia, Pa.; an iron boiler house for the Montgomery Furnace, at Point Kennedy, Pa.; a new casting shop, 69 x 167 feet, for the American Tube Works, at Somerville, Mass. They have just completed a large building for the Delaware Iron Company, at New Castle, Del., and also a large iron building for the Boston and Montana Consolidated Silver and Copper Mining Company, at Great Falls, Mon.

The Mosler Safe Company are now occupying their new works, at Hamilton, Ohio, to which place the company recently removed from Cincinnati. The plant covers 12 acres.

When the St. Paul factories of the Walter A. Wood Harvester Company of Hoosick Falls, N. Y., are started up the output and working force of the company at the latter place will be lessened about one-third. It is said that this decrease will be only temporary.

Recently authorized corporations in Illinois are as follows: Deere Implement Company, Moline; agricultural implements; capital stock, $150,000; incorporators, Charles H. Deere, Stephen H. Velie and Charles O. Nason. The Chicago Copper and Bath Tub Works, Chicago; capital stock, $15,000; incorporators, Clair E. More, S. H. Strawn and E. E. Gray. The Universal Pot Lifter Company, Chicago; hardware; capital stock, $10,000; incorporators, Emil Eitel, Carl Eitel and others. The Galvin Brass and Iron Company, Chicago; capital stock, $200,000; incorporators, Charles E. Woodruff, Thaddeus Galvin and Samuel W. Adams. Northern Steel Company, Chicago; capital stock, $200,000; incorporators, F. C. Caldwell, M. O. Naromore and Ralph A. King.

The Pittsburgh Car Wheel Company have applied for a charter. Works for the manfacture of car wheels will be established near Pittsburgh, Pa.

It is reported from Washington that a treaty was signed on the 29th ult. for the arbitration of the Behring Sea dispute, with seven arbitrators — two representing the United States, two, including one Canadian, to represent Great Britain, and one each representing France, Sweden and Italy.

TRADE REPORT.

While demoralization of the trade is reported from nearly every market, the first signs are appearing in the direction of the only remedy to cure the diseased condition of the iron industry. Our Chicago and Pittsburgh reports indicate that a number of furnaces in the Mahoning and Shenango valleys are to blow out, and that others in the Chicago district will also stop. Bessemer Pig is still weak in Pittsburgh, and Philadelphia reports a crumbling away of prices in Foundry and Forge Irons. Cincinnati records a moderate buying movement of Southern Iron for forward delivery on the basis of $9.25, Birmingham, for Gray Forge, but sacrifice sales to secure funds are still frequent in different quarters.

Billets are selling quite freely at Pittsburgh at exceedingly low prices, and the Eastern Pennsylvania mills have followed. Muck Bar, while weak in the principal producing districts is still not low enough to hold its own against cheap Billets, the inevitable result being the stoppage of puddling plants, notably in Pittsburgh, where a prompt reduction of wages to meet the contingency is impossible. The cost of converting Mill Iron into Muck Bar is about $11, while the difference between Bessemer Pig and Steel Billets is only $6 for 4 x 4 inch and $8 for 2 x 2 inch.

Steel Rails are dull in all the markets, Chicago alone reporting a good sale. There is no truth in the report circulated by a news agency in this city that the Steel Rail Association has collapsed. There may be a slight uneasiness, but the best authorities expect it to hold firmly until the summer, when the present arrangement is to be renewed.

In the Beam trade the only item of news of the week is the report that contracts for 5000 tons have been placed in Boston at 2.10¢, delivered, by far the lowest price yet named. There is little doubt that some of the mills are very eager to capture season contracts, but the transactions are closely guarded, and are difficult to trace. Probably more has been done than has come to the surface yet.

In structural material the Keystone Company of Pittsburgh have captured a large order for the Chicago elevated road. Plates, notably in Eastern Pennsylvania, are exceedingly low. In other lines the same complaint is general, but it should be noted that the volume of business in Barb Wire is growing.

The principal items of news in the metal trade are the report of a sale of about 10,000 tons of Anaconda Matte for export, the price being based on a sliding scale, and a sale of 4000 tons of Lake Copper for export. The Western Spelter producers have sought some relief by selling for export about 700 tons of that metal.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., March 1, 1892.

It is not pleasant to be under the necessity of saying that the third month of the year, which was expected to be so prosperous, commences with prices the lowest on record, and in some cases verging almost on absolute demoralization. A strict adherence to facts, however, permits of no other statement, and there is but little in the outlook to warrant hopes of any tangible or early improvement. The real source of the trouble is overproduction, and until that feature is remedied, either by a heavier demand or a smaller supply, prices must remain weak and unsettled. The probability is that from 5000 to 10,000 tons per week more of Pig Iron is being made than is consumed, the situation being still further aggravated by the determination of buyers not to take large lots, and in some cases asking for a postponement of deliveries, which are now coming due. It is not so much that general business is bad, but rather that too much has been expected in the way of improvement. The trade could probably absorb 9,000,000 to 9,250,000 tons of iron at the firm prices of last December, but 9,500,000 tons and upward is too much, and until some adjustment is made prices cannot rally. As regards finished material, there is a similar oversupply, which, however, is not actual stocks on hand so much as the capacity to furnish the supply by mills now in operation, and which are intended to remain in that condition, if there is any possibility of getting business to go on with.

There is one feature which may perhaps not have been taken into account, viz., that Steel has virtually superseded Iron, and that a mill with a 400 ton capacity of Iron, can easily turn out 500 to 600 tons of Steel, a virtual increase of capacity of from 25 to 50 per cent. Add to this the fact that most of the leading mills have made an actual increase in their facilities to a still greater extent, and it will then be seen what an enormous amount of business is necessary to keep things moving. The truth of the matter therefore seems to be that there is not any material falling off in demand, but the increase in the supply is out of proportion, and as a consequence prices are demoralized. A question hard to answer is, "When is business likely to assume its normal condition?" A very careful inquiry among those likely to be well informed, leads to the conclusion that prices are not likely to be much better for some time to come. There will be more business, but there is so much room for it that prices cannot improve to any appreciable extent. The demand is likely to be of a general character, although at least 100,000 tons of bridge work is said to be within sight, and expected to be taken some time during the next eight or ten weeks. The Elevated Railway work in Chicago cannot be delayed very much longer, and that ought to be 30,000 to 40,000 tons. A large amount of Iron is also likely to be required for architectural purposes, so that on the whole prospects are certainly not bad in this department, while the demand for car shops, locomotive shops, boiler shops, shipyards, &c., is likely to be quite equal to anything experienced during 1891. The generul opinion, in fact, seems to be that there will be a large business during the spring and summer months, but at low and perhaps not much better prices than those ruling to-day.

Pig Iron.—A gradual chipping off in prices may be noted for such lots as are sold, and increasing weakness in those which are not sold, but on which holders are becoming very anxious to realize. This statement covers pretty much the entire market, so that it is hardly worth

while to make further comment. Prices are supposed to be somewhere near to the figures named below, but all depends on quantity, brand, point of delivery, terms of settlement, &c. For Baltimore and intermediate places, extremely low figures have been quoted on Alabama Irons, and it is believed that a large amount of business has been done, but it is almost impossible to get at the exact figures. Asking prices, however, are about as follows for Philadelphia and near-by points, and 25¢ @ 50¢ less whenever freight rates will admit of a reduction, and sometimes even when there is no reduction. Sales at low prices go through all the same.

American Scotch, No. 1x	$17.50	@	$18.00
American Scotch, No. 2x	17.00	@	.....
Standard Penna (Lake Ore), No. 1x	17.25	@	17 50
Standard Penna. (Lake Ore), No. 2x	15.75	@	16 00
Standard Penna. (Lake Ore), No. 2 plain	14.75	@	15.25
Lehigh and Schuylkill, No. 1x	16 75	@	17.00
Lehigh and Schuylkill, No. 2x	15.25	@	15.75
Standard Virginia, No. 1x	16.50	@	17.00
Standard Virginia, No. 2x	15.00	@	15.50
Medium Va. and Southern, No. 1x	16.00	@	16.25
Medium Va. and Southern, No. 2x	14.50	@	15.00
Standard Penna. and Virginia Forge	14.50	@	15 00
Ordinary Forge Cinder mixed	13.50	@	13 75
Hot-Blast Charcoal	20 00	@	22.00
Cold-Blast Charcoal	25.00	@	27.00

Bessemer Pig.—More inquiry, and sales to the extent of about 10,000 tons were made during the week at about $17.50 delivered. Low Phosphorous Iron in fair demand at about $18.50 @ $19, f.o.b cars at furnace.

Muck Bars.—Sales of several lots during the week, at prices varying from $25 to $25.50, delivered to mills in Philadelphia or equivalent points.

Steel Billets.—Prices feverish and unsettled, but there is some inquiry, and the market indicates greater steadiness at about $25.50 @ $25 75, delivered at seaboard or Schuylkill Valley, and $25 @ $25 25, Susquehanna. Some business has been done at about these figures, but it is claimed that some has been done at lower figures, but it is difficult to trace the transactions, so that it is one of those things that needs to be taken *cum granum salus.*

Steel Rails.—Business dull and disappointing. Mills maintain firm prices, however, so than nothing less than $30, f.o.b. cars, can be done at present. Sales mostly in small lots, although in the aggregate they amount to a tolerably fair amount.

Bar Iron.—Market shows no change of importance, although as compared with some departments things are in fairly good condition. Orders are sharply competed for nevertheless, and all sorts of prices from 1 70¢ to 1.80¢ are quoted for first class Bars, city delivery, and 1 60¢ to 1 65¢ at interior points. All depends on magnitude of order, specification of sizes, requirements as to quality, &c., and where these are favorable to the seller, sharp concessions are not hard to obtain.

Plates.—Things do not improve in this department of business. There is a fair demand for small and medium sized lots, but nothing heavy has been offered for competition during the past few days. A considerable amount of work is said to be under negotiation, but it is not far enough advanced to be of any immediate value to the mills. Prices are terribly demoralized, and while 1 85¢ @ 1.90¢, delivered, appears to be pretty nearly bottom figures for ordinary Plates, the higher qualities are being brought lower and lower—in some cases 2.30¢ @ 2 40¢ is mentioned for Flange Steel, and even less than that on very desirable specifications. Ordinary quotations, however, are about as follows:

	Iron.	Steel.
Tank Plates	1.80 @ 1.90¢	1.85 @ 1.95¢
Shell	.....	2.15 @ 2.20¢
Flange	2.70 @ 2.90¢	2.40 @ 2.50¢
Fire-Box	3.00 @ 4.00¢	2.70 @ 3.20¢

Structural Material.—Business is very quiet in this department, and although there is a great deal of work going on, and a great deal more in prospect, the immediate condition of the trade is very unsatisfactory. Prices vary according to quantity from 1.85¢ to 2¢, delivered, for Bridge Plates; 1.9¢ @ 2¢ for Angles, and 2.25¢ @ 2.40¢ for Beams, Channels or Tees.

Sheet Iron.—The demand is somewhat limited, and except for the best makes prices are weak and irregular. Small lots quoted about as follows:

Best Refined, Nos. 14 to 20	2.20¢ @ 2.40¢
Best Refined, Nos. 21 to 24	@ 3.10¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.25¢
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....

Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3⅛¢
Best Soft Steel, Nos. 21 to 24	3⅛¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—Market hard to quote, as there is no general demand. For such lots as buyers may happen to want, prices are about as follows: Iron Rails, $20.50 @ $21 asked, spot, or $22 delivered; Steel Rails, $16 @ $17, delivered; No. 1 Railroad Scrap, $19 50 @ $20, Philadelphia, or for deliveries at mills in the interior $20 @ $21, according to distance and quality; $14.50 @ $15 for No. 2 Light; $14 @ $14.50 for best Machinery Scrap; $13 @ $13.50 for ordinary; $14 @ $15 for Wrought Turnings; $9 @ $10 for Cast Borings, and nominally $22 @ $24 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Wrought Iron Pipe.—Fair demand for small lots to complete assortment of sizes, but apart from that there is very little doing. Discounts are anywhere from 5 to 10 % more than nominal figures, which are as follows:

Butt-Welded Black	57½ %
Butt-Welded Galvanized	47½ %
Lap-Welded Black	67½ %
Lap-Welded Galvanized	55 %
Boiler Tubes, 2½ inch and under	52½ %
Boiler Tubes, 3 to 6 inch	60 %
Boiler Tubes, 7 inch and larger	55 %

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, March 2, 1892.

The most important transaction in this market in the past week is the contract let to the Keystone Bridge Company for 5 miles more of elevated track by the South Side Company. There will be some 9000 tons of Structural Steel in this contract, and it is to be completed before the opening of the World's Fair. The price at which this work has been taken is not disclosed. Considerable business is being done in various directions, and great enterprises are on foot which will shortly be put under way, but in spite of all this the market lacks tone. Manufacturers are keenly competing for business, and whenever a buyer appears in view he is almost overwhelmed with attention. The prospects are very bright for a great deal of business this season in every line, but the fear is general that facilities for production are so much in excess of the probable demand that these will continue to drag close to cost. The very low price of Steel is now seen to be a serious disturbing element in further upsetting the relations between it and Manufactured Iron. The wholesale discharge of puddlers at Pittsburgh is looked upon as portending the final struggle between the two metals for the position of the general market for Manufactured Iron.

Pig Iron.—The most encouraging news for Pig Iron producers now comes from the Mahoning and Shenango Valleys. It is stated on good authority that upward of 20 stacks are to be blown out as quickly as they can work up the material they have on hand. A few will blow out within the next week or two, but 30 days will see a great deal accomplished in the restriction of production. The Illinois Steel Company have stopped making Foundry Iron at their Union Works without putting any other furnace on in their place. The Mayville Furnace is to be blown out soon for repairs, and will then stay out until there is some improvement. Action of this kind has been imperatively needed for some time, to check the demoralization so rapidly setting in. Even if it does not go so far as to cause prices to advance, it will accomplish much by establishing hard pan somewhere. Foundrymen have been greatly benefited by this condition of affairs. They have been able to cover their requirements at a much lower rate than they expected when contracting for the sale of their castings. Some of them, it seems, have not even yet covered entire wants for the first half of the year, but have been waiting to see how low the price of Iron would go. This class is buying now to some extent and inquiries are about for 1000 tons of local Coke which was not before known to be needed. Prices are hard to quote under prevailing conditions. Quotations are nominally unchanged, but sales have been made of No. 1 Local Foundry at $14.75, of No. 2 at $13.75, of No. 3 at $13.50, of Southern No. 2 Soft at $13.50, and it is stated that Southern Gray Forge can be had at $13. It will probably be hard for buyers to duplicate these prices, if the production is curtailed as rapidly as indicated. Lake Superior Charcoal is quiet, and makers are now talking of blowing out quite generally in view of the persistent dullness. Quotations are unchanged, as follows:

Lake Superior Charcoal	$17.00	@	$17.50
Local Coke Foundry, No. 1	15.00	@	16.00
Local Coke Foundry, No. 2	14.25	@	14 75
Local Coke Foundry, No. 3	14.00	@	14.50
Local Scotch	16.00	@	16.50
Ohio Strong Softeners	17.75	@	18.25
Southern Coke, No. 1	15.75	@	16.00
Southern Coke, No. 2	14.75	@	15.00
Southern Coke, No. 3	14.00	@	14.25
Southern, No. 1, Soft	14.75	@	15.00
Southern, No. 2, Soft	14.00	@	14.25
Southern Gray Forge	13.75	@	14 00
Southern Mottled	13.25	@	13.50
Tennessee Charcoal, No 1	17.50	@	18.00
Alabama Car Wheel	21.00	@	23 00
Coke Bessemer	16.50	@	17 00
Hocking Valley, No. 1	17.25	@	18.50
Jackson County Silvery	17.50	@	18.00

Spiegeleisen—Is firm and unchanged.

Bar Iron.—Mill agents have done a moderate business in lots running from a carload to 200 tons. Some car work is in prospect and here and there other manufacturing consumers are inquiring on round lots, but there is not enough business to impart a healthy tone to the market. Prices range from 1.65¢ to 1.70¢, half extras, for usual specifications, but the smaller mills are shading these figures on the sizes they are prepared to roll. Bar Steel continues to make steady inroads on Bar Iron at 1.75¢ @ 1 80¢, from mill, with heavy concessions on extras. Some mills are offering Soft Steel car shapes at the same price as Iron.

Structural Shapes.—The bridge works in this vicinity are only partly employed at present, but a great deal of figuring is going on, and it looks as if there would be plenty of business in this line before long.

The Beam situation is not very clear. Some manufacturers report large sales, and there are rumors of favorable arrangements having been quietly made with the principal contractors and builders for their entire year's requirements. The contracts taken after an open contest during the past week will not exceed 1000 tons. Some large buildings are soon to come on the market, and considerable curiosity is manifested to know what will then be revealed. Meantime prices range from 2.25¢ to 2.40¢ for standard sizes; 2.57½¢ for small sizes, and 2.60¢ @ 2.75¢ for 20-inch. Angles are quoted at 1.95¢ @ 2 10¢; Tees at 2.25¢ @ 2.50¢, and Bridge Plates 2.05¢ @ 2.10¢, from mill.

Plates.—The market is very quiet and trade from store is disappointing. Dealers quote from stock: Tank Iron, 2 40¢ @ 2.50¢; Tank Steel, 2 30¢ @ 2.40¢; No. 10 to No. 14 Sheets, Iron or Steel, 2.40¢ @ 2.50¢; Flange Steel, 2.90¢ @ 3¢; Shell Steel, 2.60¢ @ 2.75¢; Rivets, 4¢ @ 4.25¢; Boiler Tubes, 3-inch and larger, 65 % and 5 % @ 67½ %; 2¾ inch and less, 55 %. Tank Steel in mill lots is selling at 2¢ @ 2.10¢.

Sheets.—The demand for Black Sheets is rather light, and the usual quotation on No. 27 Common is 2.85¢, from mill, but manufacturers are unwilling to contract far ahead at that rate. Light Steel Sheets command 2.95¢ @ 3¢ for No. 27. Jobbers quote from stock No. 27 Iron, 3.10¢ @ 3.20¢, and Steel, 3.40¢. Galvanized Iron shows some pressure to sell, and prices are less firm than they were. Agents are apprehensive that some makers will take large contracts from jobbers at the low prices now coming up, and thus bar the way to an advance later in the season. Mill lots are quotable at 70 % off on Juniata, while jobbers quote 67½ %.

Merchant Steel.—The past week has seen an excellent trade in small lots, with an occasional good order from a manufacturing consumer. Open-Hearth Machinery is quoted at 2¢ @ 2.10¢, from mill, according to finish; Open-Hearth Spring and Tire at 2¢ @ 2.25¢, according to quality. Tool Steel is a little firmer under the good demand now ruling and sells readily at 6½¢ upward.

Track Supplies.—Steel Rails are looking up, as good inquiries are now in hand. One order now about closed calls for some 16,000 tons. A number of smaller orders have been entered by the local mills and the outlook is regarded as quite promising. Prices range from $31.50 and upward. Competition for Splice Bar orders is brisk, with 1.80¢ quoted on Iron or Steel. An order for 6000 kegs of Spikes is in the market and another for 1500 kegs Track Bolts. Spikes are quoted 2 15¢ @ 2.20¢ and Hexagon Nut Track Bolts, 2.65¢ @ 2.80¢.

Old Rails and Wheels.—Old Iron Rails have slumped to $20.75 @ $21, with sales made at the equivalent of these prices. Short pieces Old Steel Rails hardly bring $14 now and long lengths are neglected. Car Wheels are quiet, but holders still ask $16 for them.

Scrap.—Cast is in good demand and Steel is fairly active, but everything used by rolling mills is very flat. The only movement of Forge Scrap coming to light was an exchange of 300 tons for Car Axles, made by a railroad company. Quotations unchanged, except Horse Shoes, $17.50; Axles, $21; Pipes, $12; Machinery Cast, $12.25; Malleable Cast, $10; Mixed Steel, $13; Coil Steel, $15.

Metals.—Copper is unchanged, carload lots of Lake selling at 10.75¢ and casting brands 10⅜¢. Spelter is still quoted at 4 50¢, with offerings by some sellers at a trifle lower.

The Pig Lead market is reported gradually though slowly working up into a better condition both as to the quantity of Lead sold and the prices obtained therefor. The close of the week finds Lead more salable. The week's transactions here amount to some 300 tons Desilverized and Missouri at 4¢.

Frank R. Blaurock has been appointed sales agent at Chicago for the structural, implement and railroad business of the Oliver Iron and Steel Company of Pittsburgh. He has taken temporary quarters in Room 200, Phenix Building. Mr. Blaurock is well known throughout Iron and Steel circles in the Northwest, having for a long time represented Brown & Co. of Pittsburgh, and more recently was connected with Park, Bro. & Co.

The Willson-Waugh Commission Company, Chamber of Commerce Building, Chicago, are sales agents for the Indiana Steel Company, New Albany Rail Mill Company, Premier Steel Company and St. Louis Steel Foundry Company. They are prepared to furnish Beams and other Structural Shapes, Steel Billets, Bar Iron, Street Rails, Track Fastenings, Steel Castings, &c. J. Milton Waugh, secretary of the Willson-Waugh Commission Company, conducts their business. He was formerly secretary of the Waugh Steel Company of Belleville, Ill., and is thoroughly conversant with the details of the Iron trade both from a practical and a commercial standpoint.

W. H. Crowl of Cleveland has been engaged by the Pine Lake Iron Company, whose main office is in The Rookery, Chicago, to sell their Champion Lake Superior Charcoal Pig Iron. Mr. Crowl is an experienced Pig Iron salesman who has established for himself an excellent reputation, and he is regarded as a most reliable acquisition to the Chicago Pig Iron trade.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, March 1, 1892.

Pig Iron.—A further decline in prices has occurred, and the question now asked on all sides is, When will the market reach bottom? The queston is answered by some who say that it looks as if there was no bottom to it. As we said last week, there seems to be but one solution to the problem, and that is curtailment of production. That this is the correct view of the situation is evidenced by the fact that one of the largest Pig Iron concerns in the country have determined to blow out their furnaces until there is a better state of things. Two of their stacks are located at West Middlesex, one at Sharpsville, one at Struthers and the other at Cleveland. We also have advices that a number of other stacks in the Mahoning and Shenango valleys will be closed during this month. Pierce, Kelly & Co., operating the Douglass furnaces at Sharpsville, Pa., are in financial trouble, precipitated by the suicide of George T. Kelly. Their plant will undoubtedly be closed down within a short time. In Pittsburgh every stack is producing Iron with the single exception of Soho. At the present rate of production Allegheny County is making about 150,000 tons of Iron per month. For the week under review there has been a further decline in prices, especially in Bessemer, while No. 1 Foundry and Gray Forge are weaker. We quote as follows:

Neutral Gray Forge	$13.00	@ $13.25,	cash
White and Mottled	12.50	@ 13.00,	"
All-Ore Mill	13.75	@ 14.25,	"
No. 1 Foundry	15.00	@ 15.25,	"
No. 2 Foundry	14.25	@ 14.50,	"
No. 3 Foundry	13.75	@ 14.00,	"
Bessemer Iron	14.75	@ 15.10	"
Warm-Blast Charcoal	18.50	@ 20.00,	"
Cold-Blast Charcoal	25.00	@ 27.00,	"

Some very large transactions in Bessemer took place last week, sales aggregating 25,000 tons having been reported. The sales were made for March, April and May delivery, and the price named is $14.75, cash, 30 days. The sales were made by city furnaces, while one sale of 3000 tons of Bessemer for April and May delivery has been made by a Valley furnace at $14.75, delivered in Pittsburgh. This Iron netted the furnace $13.95 per ton. Some of our furnacemen have drawn the line at $15, and emphatically state that they will not sell a pound at less than that price. Good authorities venture the opinion that the market will not go below $14.75, and that Bessemer at that price is good stock.

Steel Billets.—If anything the market is in worse shape as regards prices and during the past week sales were freely made at $23, f.o.b. at mill. Reports are going of a large transaction at even less than the above price for April and May delivery, but it is generally discredited. However, it is distinctly a buyers' market, and the mills are anxious for business. We quote nominally at $23 @ $23.50. Sales of one lot of 10,000 tons and another of 5000 tons for March, April and May delivery are reported at $23, f.o.b. at mill. Also a sale of 3000 tons at $23.25 for same delivery. Several makers here have closed down and have refused to meet the market.

Muck Bar—The market could hardly be worse than it is now. A number of our mills have closed down their puddling departments for an indefinite period. There are more idle puddling furnaces in Pittsburgh to day than for years. In the absence of business we quote at $24.75 @ $25. Orders could be placed at the former figures without difficulty.

Ferromanganese—Remains as quoted last week, $62.50 @ $63 for domestic. Little business is going.

Wire Rods.—The market continues quiet and the sales going are for small lots. A large Rod mill in this district is closed down at present for repairs. We continue to quote at $32.75 @ $33, with the former as the ruling price. A desirable order would probably shade above prices slightly.

Structural Material.—The effects of the dissolution of the Beam pool do not seem to have cleared away and the market is unsettled. Beams and Channels are lower and we have again reduced quotations. The low prices do not seem to have accelerated buying to any great extent, although our manufacturers look for a large business when the building season opens. The decline in prices is expected to result in a largely increased demand for Structural Material, as heretofore the higher prices ruling often prohibited the use of Iron or Steel Shapes on account of their cost. During the past week Pittsburgh captured a large order for Shapes. It was taken by the Keystone Bridge Company and is for the uncompleted portion of the Alley Elevated Road in Chicago. About 11,000 tons of material will be needed. The balance of the road will be built after the same design as that portion already erected. We quote prices as follows: Beams and Channels on a basis of 2.35¢ @ 2.45¢; Angles, 1.90¢ @ 1.95¢; Tees, 2.50¢; Universal Mill Plates, 1.95¢ @ 2¢; Refined Iron Bars, 1 75¢; Steel Bars, 1.75¢.

Steel Plates—Remain the same as given last week. Orders are not plenty and much more business could be taken care of if it could be secured. We quote Fire Box, 3.75¢ and 4.15¢; Flange, 2.30¢ and 2.35¢; Shell, 2.15¢ and 2.20¢; Tank, 1.90¢ and 2¢.

Steel Rails.—We are not advised of any large orders placed recently. Were it

not for orders booked some time ago, it would be difficult to find enough to keep going. Predictions have been made that when the mills get hungry for business the Rail agreement will go the way of the Beam pool. We quote $30 for standard sections, f.o.b. at mill.

Nails.—There is not much business going in Cut Nails, and prices are on a lower level. Several concerns in the Wheeling district have recently reduced wages for Nail cutting in order to lessen cost of production as much as possible. As each mill is working under a private arrangement with their nailers, it is not known what prices are being paid for Nail cutting. We quote at $1.50 in carload lots for 30¢ averages, f.o.b. at factory in Wheeling district. We understand some sales have been made recently at $1.47½, based on 30¢ averages. The demand for Wire Nails continues good, and it is claimed prices are being firmly maintained. We quote at $1.70 for carload lots and $1.75 for smaller quantities. With the low prices of Billets now ruling Wire-Nail makers can no doubt realize a fair profit in Nails at present prices.

Barb Wire.—As we stated last week, the decline in prices has stimulated orders and considerable business is going. Sales are reported at very low prices but in some cases are denied by manufacturers. We quote $2.25 @ $2.35 for Painted and $2.65 @ $2.75 for Galvanized, f.o.b. at factory.

Manufactured Iron.—Orders are not coming in as freely as was expected, and as a consequence the mills are only running moderately full. Prices have weakened somewhat, but no material decline is noticeable. We quote No. 1 Bars at 1.65¢ @ 1.70¢, 60 days, 2 % off for cash. Bars from Old Rails at 1.55¢ @ 1.60¢. It is said the last named prices are being shaded considerably by Valley mills. We quote Sheet Iron at 2.50¢ @ 2.60¢ for No. 24. Plate and Tank Iron is quiet at 1.85¢ @ 1.95¢. Skelp Iron is very dull, and the demand is falling off. We quote at 1.57½¢ @ 1.60¢ for Grooved and 1.77½¢ @ 1.80¢ for Sheared, four months, 2 % off for cash.

Wrought-Iron Pipe.—Business continues very dull, but as stated last week, an improvement is looked for when the roads improve. One concern here state that their business for February was larger than in any month during the past six months. Of the six tube and pipe mills in the Pittsburg district proper, but four are in operation and these are running but little better than half capacity. Nominal discounts remain as follows: Discounts on Black Butt Pipe, 57½ %; on Galvanized, 47½ %; on Black Lap Weld, 67½ %; on Galvanized, 55 %; Boiler Tubes, all sizes up to 2¼ inches, inclusive, 55 %; 3 inches and larger, 65 %; Casing, all sizes, 55 %; Inserted Joint Casing, 50 %. Sales continue to be made at from 5 to 10 % lower than above list.

Old Rails.—No improvement in demand is reported and but few sales are being made, and those for small lots. We quote Old Steel Rails at $16.75 @ $17 for short pieces; $17 @ $17.25 for miscellaneous lengths, and Old Iron Rails, nominally, $22 @ $22.50.

Merchant Steel.—Orders are not very plentiful, but manufacturers state this is their dull season and an improved demand is expected soon. We quote Tool Steel, 6½¢ @ 10¢; Crucible Spring Steel, 4¢; Crucible Machinery Steel, 5¢; Bessemer Machinery Steel, 2.35¢ @ 2.45¢ ₱ lb.

Scrap Iron.—A slightly better feeling is reported and inquiries are coming in a little better. We quote No. 1 Railroad Wrought Scrap, $18 @ $18.50 per net ton; Cast Scrap, $12.50 @ $13 per gross ton; Steel Rail and Bloom Ends, $17.50 @ $18; Cast-Iron Borings, $9.25 per net ton; Machine Shop Turnings, $12.50 per net ton; Mixed Country Steel, $14 @ $14.25 per net ton. We note a sale of 200 tons of No. 1 Railroad Wrought Scrap in the Mahoning Valley at $18 per net ton; cash, 30 days.

Railway Track Supplies.—A fair business is doing, but no change in prices. We quote as follows: Spikes, 2.15¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ for Hexagon Nuts.

The offices of Alexander Thomas & Co., brokers in Iron and Steel and assignee for Jas. P. Witherow, have been removed from 602 and 603 German National Building, Pittsburgh, Pa., to rooms 303 and 304 in the same building.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
NEW YORK, March 2, 1892. }

American Pig.—The market continues very dull and irregular, and concessions are general. Alabama Iron is selling on the basis of $9.25 for Gray Forge, forward delivery, and at any price, in some cases, for cash, prompt delivery. We quote Northern brands, $16.50 @ $17.50 for No. 1; $15.25 @ $16 for No. 2, and $14 @ $14.50 for Gray Forge, tidewater. Southern Iron sells at $15.75 @ $17 for No. 1; $15 @ $15.50 for No. 2 and No. 1 Soft, $14 @ $14.25 for No. 2 Soft; $13.50 @ $14 for Gray Forge.

Ferromanganese and Spiegeleisen.—There have been no transactions in either Spiegel or Ferro, which we quote $23 @ $23.50 for 10 to 12 %, $26.50 @ $27 for 20 %, and $62 @ $62.50 for Ferro.

Billets and Rods.—In this market both foreign and domestic Billets and Rods are dull. We quote foreign Rods $42.25; @ $42.50, and domestic Rods $36 @ $36.50, tidewater. Domestic Billets may be quoted $25.75 @ $26.50, tidewater, New York and New England delivery.

Steel Rails.—So far as the Eastern mills are concerned, the Steel-Rail trade is languishing in an unaccountable manner, sales being confined to small lots, and little new work of magnitude coming up. Those railroad managers who have not yet placed their orders readily admit that they will want the material. But they argue that since there is no danger of an advance, they can afford to wait. They point to the large capacity of the Eastern mills, which thus far is only slightly employed, and whose territory is virtually restricted to the country east of Buffalo and the Alleghenies, the South and the Gulf, so far as it is easily reached from tidewater, and finally the Pacific Coast, for some distance inland. The leading Eastern trunk lines and coal roads have placed their orders and there is a little business still forthcoming in New England, and some from the Southern Atlantic seaboard. But unless there is a decided change, the tonnage forthcoming from the natural territory of the Eastern works is not very much larger than it was last year. Whether they can hope for some Western work this year may be still regarded as a mooted question. The movement made by the Cleveland Rolling Mill Company makes it more uncertain. Prices remain $30 at Eastern mill.

Manufactured Iron and Steel.—The Beam situation is virtually unchanged, no large transactions having taken place in this market. Beams have sold, however, in round lots at 2.25¢, while small parcels fetch as much as 2.40¢ and 2.50¢. During the week a leading architectural concern has taken the contract for an office building in Broadway, for which some of the larger sized Beams may be bought. The bulk of the metal is, however, probably to be taken from stock. On the whole there has been a little more activity in structural works, one of the orders placed being a standpipe for a New England water works. Contracts have been placed for bridge work also, but the item of greatest interest remains the McComb's Dam bridge, for which bids are now going in. It calls for about 2000 tons of Plates, and for Angles, Rivets and Bars to carry the total up to about 3800 net tons. As yet nothing has been done in the way of Ship Plates. Prices on all forms of Structural Material and Plates continue exceedingly low. One main source of trouble is that specifications for work placed are not forthcoming promptly, so that the mills are seizing every opportunity to secure work in the interval. We quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams 2.30¢ @ 2.80¢; Channels, 2.30¢ @ 2.50¢, on dock. Car Track Channels, 2¢ @ 2.10¢; Steel Plates are 1.85¢ @ 2.1¢ for Tank; 2.15¢ @ 2.30¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.60¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2¢ @ 2.20¢, delivered. Steel Axles, 2¢ @ 2.2¢, and Links and Pins, 2.1¢ @ 2.20¢; Steel Hoops, 1.95¢ @ 2.05¢, delivered.

Merchant Steel.—We quote: Hot-Rolled Shafting, 1.90¢ @ 2¢; Machinery, 1.90¢ @ 2.10¢; Tire, 2¢ @ 2.25¢, and Toe Calk, 2.20¢ @ 2.35¢, delivered.

Track Material.—It has been learned now that the New York Central order for Angles taken some time since was placed as low as 1.55¢, the lowest price on record for this class of material. We quote Spikes, 1.95¢ @ 2.05¢; Angles, 1.65¢ @ 1.70¢, and Bolts, 2.60¢ @ 2.75¢, delivered.

Carnegie, Phipps & Co. of Pittsburgh have issued, neatly bound, a new telegraphic code for Angles, Beams, Channels and miscellaneous Structural Iron.

Metal Market.

Copper.—It is understood that about 4000 tons of Lake Superior Ingot have been sold of late for export, but whether this business was a part of the 10,000,000 pounds referred to last week is not clear. It is also reported that the Anaconda Company have sold upward of 10,000 tons of Matte for delivery six months ahead, on export account, at prices to be governed by those ruling for Merchant Bars and Best Selected English in the London market at time of delivery. Our special cable from London confirms the latter deal, noting, as it does, contracts for 9000 tons, deliverable 1000 tons per month, on the terms above referred to, but similar confirmation of the sales of Ingot for foreign account are wanting. Home trade movement has been chiefly of routine character, yet of fair volume, and the market at present shows fairly steady tone, with the offering more reserved than it has been for some time past. Lake Superior is quoted at 10½¢, bid, 10.65¢ @ 10¾¢ asked, and Casting Copper at 10½¢ @ 10⅝¢, according to brand, size of lot and delivery.

Pig Tin.—Speculative dealings in this metal have been of very narrow proportions, the movement on trade and consumptive account being merely fair, and the fluctuation in prices moderate, varying but little from the range within which business was effected during the preced-

ing week. In short, the market may properly be described as having been quiet and barely steady. At the moment, 19.60¢ is apparently the extreme outside price for Straits in 10-ton lots for prompt or current month delivery, and 19.65¢ the top rate for April delivery. Jobbing parcels have moved at 19¾¢ @ 19⅞¢, according to terms and size of lot. Straits shipments during the month of February were 1675 tons to Great Britain and America, and 650 tons to the Continent, against 2450 tons and 500 tons respectively during the preceding month. Between the quantity on spot in the foreign and home markets and the amount afloat, a liberal supply is afforded, and, from the statistical point of view, the market is still rather weak, although somewhat better at the present time than it was a month ago.

Pig Lead.—About 50 tons were sold at 4.20¢, and subsequently 50 tons at 4.15¢, to make the "official prices," but otherwise a remarkably small business has been consummated and the market at present is slow. The offering continues to be reserved, however, and smelters are apparently indifferent sellers in view of the labor difficulties at some of the mines, and the fact that supplies in consumers' hands, as well as in the Eastern market, are unusually moderate. To all accounts the consumption is fully up to the average for the season, particularly by corroders, but the buying is still on strictly conservative lines and affected very little, if at all, by the situation of affairs in the West.

Spelter.—About 700 tons of Western, it is reported, have lately been sold for export at prices on the basis of 4.55¢ at New York. This movement, however, does not appear to have had greater force than to merely steady the market, since stocks in smelters' hands are still liberal and the home trade demand slow and hesitant. For carload and larger quantities 4.55¢ @ 4.60¢ is quoted, but the outside prices is an exceptional one on actual dealings.

Antimony.—The demand has been of routine character and the market rather weak, with 10¼¢ @ 11¢ quoted for Hallet's, 12½¢ for LX and 15¢ for Cookson's, in wholesale quantities.

Tin Plate.—In light-weight Cokes and in Ternes for future delivery there has been a very fair business, chiefly at about former prices, but otherwise the market has remained quiet and the demand for spot goods is momentarily rather slow. For spot goods prices stand practically the same as they were a week ago, but lack decided firmness. We quote as follows for full weights: Coke Tins—Penlan grade, IC, 14 x 20, $5.25; J. B. grade, do., $5.35; Bessemer do., $5.30; Siemens Steel, $5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75 @ $5.80; IX basis, $6.80. IC Charcoals—Melyn grade, ½ X, $6.35; for each additional X add $1.50; Allaway grade, $5.75: Grange grade, $5.85; for each additional X add $1.20, Charcoal Ternes — Worcester, 14 x 20, $5 75; do., 20 x 28, $11.37½; M. F., 14 x 20, $7.37½; do., 20 x 28, $14.75; Dean, 14 x 20, $5 50; do., 20 x 28, $10.60; D. R. D. grade, 14 x 20, $5.35; do., 20 x 28, $10.25; Mansel, 14 x 20, scarce; do., 20 x 28, $10 50; Alyn, 14 x 20, $5.45; do., 20 x 28, $10.50; Dyffryn, 14 x 20, $5.65; do., 20 x 28, $10.90. Wasters—S. T. P. grade, 14 x 20, $5.10; do., 20 x 28, $10; Abercarne grade, 14 x 20, $5; do., 20 x 28, $9.65.

C. Kirchhoff, special agent of the United States Geological Survey, reports the production of Lead in the United States as follows, the unit being the ton of 2000 lb:

Year.	Total Production.	Desilverized Lead.	Non-Argentiferous Lead.
1875	59,640	34,909	24,699
1876	64,070	37,649	26,421
1877	81,900	50,748	31,152
1878	91,060	64,290	26,770
1879	92,780	64,650	28,130
1880	97,825	70,135	27,690
1881	117,085	86,315	30,770
1882	132,890	103,875	29,015
1883	143,957	122,157	21,800
1884	139,897	119,965	19,932
1885	129,412	107,437	21,975
1886	135,629	114,829	20,800
1887	160,700	135,552	25,148
1888	180,555	151,465	29,090
1889	182,967	153,709	29,258
1890	161,754	130,403	31,351
1891	202,406	171,009	31,397

While the production during the first half of 1891 was 95,121 tons (79,301 tons desilverized and 15,820 tons non-argentiferous Lead), the output of the second half was 107,340 tons (91,864 tons desilverized and 15,577 tons non-argentiferous Lead). Included in the above production is 4043 tons of antimonial Lead, the refiners having for the first time reported the product of this grade.

Stocks, as reported by producers, were 7693 net tons of refined Lead.

Financial.

The stability of the markets and of financial institutions generally for months past, despite numerous commercial failures, heavy gold exports, the silver agitation and large sales abroad of American securities are regarded as indubitable evidence of the substantial prosperity of the country and soundness of mercantile credit. Trade undergoes little change from week to week, though complaints of dullness and small profits are not infrequent, and no concealment is attempted of the fact that gold shipments on a large scale would excite a certain degree of apprehension, coupled as it is with the foisting upon Congress of various schemes for the indefinite expansion of silver coinage. The latest movement at Washington is the order for considering the silver question in the House reported on Monday, but which will not be voted upon till Monday next, and in regard to Secretary's Foster's visit to Europe a dispatch from Washington says: "It is not denied at the Treasury that informal negotiations have been pending for some time looking to an international monetary conference; also that Mr. Goschen has notified Minister Lincoln that England will enter the conference." Moreover, in response to circulars sent out by the London Chamber of Commerce, Mr. Goschen determines to place the subject before Parliament. Another circumstance of more than ordinary import is a decision handed down by the United States Supreme Court on Monday declaring the McKinley Tariff act constitutional. The decision was based on three appeals, in which importers sought to have the law declared invalid. A feature of the week is renewed evidence of hostility to trusts. A committee of the New York Senate commenced an inquiry into the coal trust, and proceedings of a like nature are pending in Pennsylvania and New Jersey, but thus far without tangible results, and in Boston, J. B. Greenhut, president of the Whiskey Trust, has been indicted by the Federal Grand Jury for violation of the Anti-Trust law. Other arrests took place in Cincinnati.

In the stock market after the middle of the week, there was an improvement in the tone, based mainly upon the reports that England had consented to a conference on the silver question. The coal stocks were influenced by the announcement that the preliminary steps toward the investigation of the Reading leases had been taken by the Pennsylvania authorities. On Saturday the feature was an important rise in Lackawanna, Central New Jersey, Delaware and Hudson, and in Denver and Rio Grande preferred, and the market closed strong. Among the heavy stocks were Chicago Gas, and there was a decline in New York and New England on a statement that the dividend on the preferred stock would be passed. On Monday Reading advanced, followed by New York Central, the other Vanderbilts, Erie, New England and the grangers, and the tone was buoyant until there appeared to be realizing sales in the coal shares. The reaction was partly due to news of the engagement of $1,030,000 gold for export. The reported buying of the Delaware and Hudson by the New York Central and again by the Pennsylvania was positively denied.

United States bonds closed as follows:

U. S. 4½s, 1891, extended	100
U. S. 4s, 1907, registered	116½
U.S. 4s, 1907, coupon	115½
U.S. currency 6s	109

In the money market rates on call were unchanged, but for time loans there was a firmer tone at 3 % for 30 to 60 days, 3½ % for 90 days to four months and 4 % for five to seven months. The demand for commercial paper was lighter. The weekly bank statement showed a decrease of $3,887,850 in the amount of reserve held above the 25 % legal requirements. Loans expanded $4,300,000 and specie decreased $5,337,800. For the week deposits are generally larger, with much idle money and little demand for discounts.

Foreign exchange is steady at $4.86½ @ $4.89. Contrary to expectations, the Bank of England allowed its rate of discount to remain at 3 %. Exports to Europe were $2,250,000 on special order. The ultimate destination of the gold, whether Russia or Austria, is still in dispute.

In general merchandise the movement of cotton is somewhat reduced, receipts having fallen off, but prices are $\frac{1}{16}$ lower ₱ lb for spot. Wheat experienced a decided knock of 3¢ ₱ bushel, partly due to the improved prospects of winter wheat, but prices are still higher than before the Chicago speculation was initiated some three weeks ago. Exports of wheat are falling off, though still ranging between 3,000,000 and 4,000,000 bushels per week, while corn is going out in larger quantities. Exports of pork products fall short of last year's for the same time about 20 %. Sugars are fairly sustained, coffee easy.

The foreign commerce of the United States for January shows a favorable balance of trade, amounting to $38,348,000, the total exports having been $102,736,000, against which are imports equal to $64,000,000.

The imports of merchandise show a slight increase (all of it at this port), but imports of specie and bullion declined over $1,000,000. For seven months the total exports were $680,508,000 and imports $513,573,000; balance, $167,000,000, as against $75,000,000 for the same time in 1891. Included in the exports were $29,000,000 in specie and in the imports $55,000,000.

Total East-bound shipments past week, 97,075 tons, against 94,017 the week before, and 76,531 same week last year.

Coal Market.

The Anthracite Coal market is still much exercised by the recent combination of interests and the counter movements growing out of it, in the effort to bring the large independent operators to terms. Meanwhile, or at least until a final settlement of questions of allegiance shall be reached — "under which king?" — the latter are making no sales, having withdrawn from the market. Whether middlemen are indispensable to conduct the business becomes an interesting subject of inquiry in various circles. A common

impression among the latter is that eventually the independent concerns must go, and that in the absence of competition higher prices are bound to prevail in course of time. For prudential reasons, especially while legislative inquiry is taking place, the combination will make haste slowly. Broken is quoted $3.50 @ $3.60; Stove, $3.75; Chestnut, $3.25, f.o.b., net; Pea, $2.25 @ $2 75, according to quality; Buckwheat, $1.90 @ $2 25.

Eastern sales agents of the Anthracite Coal companies, at Friday's meeting, recommended that the production for March be fixed at 2,500,000 tons, including the estimated production of the Pennsylvania Railroad and Ontario and Western Railroad. No change was made in prices.

A proposition made by President McLeod of the Reading Railroad to the independent operators producing Coal in the Lehigh Valley is under consideration, and report says that several important concerns have accepted the terms submitted, which are stated as follows: At $4 per ton or less the operator gets 60 per cent. and the railroad 40 per cent. Over $4 per ton the operator gets 40 per cent. of the advance and the railroad 60 per cent. All over $4 50 per ton the operator gets 30 per cent. of the advance and the railroad 70 per cent. He virtually guarantees a minimum price of $4, f.o.b., for Stove, a higher average price than has ruled for years. A Wilkesbarre dispatch says definitely that the Red Ash Coal Company have closed a bargain, while others hesitate, as the Pennsylvania Railroad Company are in the field and are disposed to go one better. A Scranton dispatch said the latter have secured control of the plant of the Delaware and Hudson Canal Company, which is connected with the Pennsylvania at Wilkesbarre, but this was officially contradicted. The market is quoted firm but quiet at the latest advance.

From the statement of January shipments, as furnished by John H. Jones, it appears that the total tonnage from all the regions was 2,809,866 tons, a decrease of 329,094 tons compared with January, 1891, distributed as follows: Wyoming region, 163,379 tons; Lehigh, 146,074 tons and Schuylkill, 19,640 tons. The stock of Coal at tidewater increased 153,264 tons.

Surprise was occasioned by the purchase in behalf of the New York and New England Railroad Company of the short line extending from Meriden and Waterbury to tidewater on the Connecticut River. The purchasers, it is said, will extend it to Andover, on the main line, thereby securing an air line across the State of Connecticut, and materially reducing the distance between Waterbury and the East.

Louisville.

LOUISVILLE, KY., February 29, 1892.

There has been but little buying of Iron, and some concessions in price have been made, buyers at the present moment not being willing to contract for more raw material than they already have orders for their finished product. Dullness is reported among the small consumers of Iron and Pipe companies; there is, however, some activity in rolling mills and car works, but the price at which they buy continues to be basis of $9.50 for Gray Forge at furnace. Though the price is a temptation to purchase for long delivery, yet a strong disposition is shown not to speculate beyond one's requirements. There has been no buying on the part of speculators, and though the present moment would be very advantageous to those desiring to invest, owing to the low price of Iron, yet, as a general rule, they prefer to pay more money and purchase on a rising market. The demand for Car Wheel continues fair, with no shading of prices. We quote for cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry	$14.00 @ $14.50
Southern Coke, No. 2 Foundry	13.00 @ 13.50
Southern Coke, No. 3 Foundry	12 50 @ 12.75
Southern Coke, Gray Forge	12.00 @ 12.25
Southern Charcoal, No. 1 Foundry	15.75 @ 16.75
Southern Car Wheel	18.00 @ 19 00

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 2 1892

After weeks of comparative stagnation in the market, during which the developments have been of a pronounced character in favor of buyers, there has been considerable increase in the volume of business the past week, and lower prices have been made for Gray Forge and Foundry Coke Iron. Gray Forge has sold at $9.25 at the furnace, and Foundry Iron on relatively the same basis, and for deliveries running well through the year. Consumers emboldened by the large production have been trying to buy for still lower prices, but find that the Furnaces refuse to yield further. The sales probably aggregate 15,000 or 20,000 tons at these prices, besides which there has been a fair volume of consumptive orders for comparatively small quantities, for which better prices were obtained. There is a good demand for Charcoal Iron, which is in comparatively light supply, and sales have been effected at previous prices of considerable volume in the aggregate, although not to a large extent individually One of the most hopeful indications on the consumptive side of the market is that the melting of Iron is increasing in nearly every branch and buyers who thought their contracts would carry them through the summer find that they must soon buy more of the raw material. We hear of several furnaces that have suspended operations, and it would not be surprising to find that the production at an early date was less than the requirements of the trade. The darkest time is said to be just before the dawn. We give revised quotations for several grades of Iron:

Foundry.

Southern Coke, No. 1	$14.25 @ $14.50
Southern Coke, No. 2	13.25 @ 13 50
Southern Coke, No. 3	12.50 @ 12 75
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15 50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	19.75 @ 20.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00

Forge.

Gray Forge	12.00 @ 12.25
Mottled Neutral Coke	11.75 @ 12.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	19.75 @ 20.00
Lake Superior Car Wheel and Malleable	18.75 @ 19.00

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date February 29, 1892, say: There has been a brisk demand for Iron during the past week and several large orders for Southern Irons, mostly low grades, with also a few round orders for Ohio Strong Irons, for deliveries extending through the balance of the year. While it is generally admitted that prices have been at or near cost for several months, yet the prices that are being made at this time are lower than at any time previous. It is becoming more and more apparent that unless a very sudden falling off in production takes place prices will soon be so much below the cost of production that it will only be a question of a very short time when the weaker furnaces will have to close down. Lake Superior Charcoal and Silveries have not been in as great demand, but prices on these grades have been firmer. With an active but weak market we quote as follows:

Lake Superior Charcoal, all numbers	$17.00 @ $18.00
Lake Superior Coke, Bessemer	16.50 @ 17.00
Lake Superior Coke Foundry, all ore	17.00 @ 18.00
Ohio Blackband (40 per cent.)	17.50 @ 18.00
Southern No. 2	15.25 @ 15.50
Southern Gray Forge	13.50 @ 14.00
Jackson County (Ohio) Silvery	18.00 @ 18.50

St. Louis.

Office of *The Iron Age*, Bank of Commerce Building, ST. LOUIS, February 29, 1892.

Pig Iron.—The market has not changed much since our last report. Consumers are kept fairly well employed, but are not buying in large quantities, preferring rather to purchase as their requirements demand. This sort of buying stimulates competition, and some low prices have been accepted in consequence. Stocks at the furnaces continue to accumulate, and there is more urgency to sell to-day than there was two or three weeks since. Furnacemen complain that there is no profit in the manufacture of Iron at the prices ruling to-day. This is undoubtedly true, and yet they continue to work up to their full capacity and in so doing only help to keep prices down to their present low level. Consumers who are considered as sharp buyers are holding off with the expectation of being able to place their orders at lower prices than at present prevailing. The question naturally arises, Will they be able to do so? This is, indeed, a hard question to answer, but the outlook is anything but encouraging, and lower prices would not come in the shape of a surprise, but rather as a disappointment. There is only one hope for the market, and that is an early revival of trade, which alone will help the market. A shutting down of a number of furnaces would, of course, bring about the same result, but this remedy is classed among the possibilities but not probabilities. Hence, until some improvement is noticed in the demand there is very little likelihood of better prices. During the week under review sales did not run much over 200 or 300 ton lots for prompt shipment. We quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry,	$14.00 @ $15.00
Southern Coke, No. 2 Foundry,	13.75 @ 14.25
Southern Coke, No. 3 Foundry,	13.00 @ 13.50
Gray Forge	12.00 @ 12 75
Southern Charcoal, No. 1 Foundry	16 75 @ 17.25
Southern Charcoal, No. 2 Foundry	16.00 @ 16.50
Missouri Charcoal, No. 1 Foundry	15.25 @ 15.75
Missouri Charcoal, No. 2 Foundry	14.75 @ 15.25
Ohio Softeners	17.75 @ 18.75

Bar Iron.—Trade continues to be dull and uninteresting. Mills are running short of work, and jobbers are complaining that the outlook is not of a very encouraging nature. Prices are a trifle weaker, and are quoted as follows: Car lots at East St. Louis, 1.70¢ @ 1.75¢, half extras; lots from store, 1.85¢ @ 1.90¢, according to quantity.

Barb Wire.—Trade in this department continues to increase in volume. Dealers are ordering freely and request shipments to be made as prompt as possible. A local mill state they are forty carloads behind their orders. Prices remain firm as last quoted. Less than car lots of Painted, $2.60; Galvanized, $3.10. Carload orders are quoted at 10¢ ₱ hundredweight less than these prices.

Wire Nails.—The demand for Wire Nails continues fairly active. Jobbers have been buying freely of late in anticipation of a heavy spring trade. Mills re-

port a steady flow of orders. Prices are firmly maintained at the recent advance. We quote as follows: For medium sized orders the $2.05 rate prevails, while jobbers quote $2.10 @ $2.15 for small lots. Mills quote $1.95 for carload orders.

(*By Telegraph.*)

Lead.—The demand for Pig Lead has eased off somewhat, and the market is a trifle weaker. Sales have been made at 3.95¢ for prompt delivery. Sales could readily be made at 3.90¢, but sellers are firm at 3.95¢, and a waiting market is the result The future course of prices is difficult to determine, but judging from conditions at present prevailing, lower prices are likely to ensue.

Spelter—Continues to be dull and neglected, and sales are reported at between 4.25¢ and 4.30¢. Stocks in smelters hands continue to increase and the outlook, so far as prices are concerned, is not very encouraging.

Cleveland.

CLEVELAND, O., February 29.

Iron Ore.—The Ore market at present is exceedingly quiet, but few, if any, sales being reported. This temporary cessation in the demand can be attributed to a reaction from the unusually large sales of six weeks or two months ago, and, of course, the uncertainty of the Pig Iron trade and the falling off in the demand for Billets also have their share to do with it. Everything now points to an early season in lake navigation, and the vessel men are making active preparations. Notwithstanding the present lull in the Ore market, the sales already made are of such magnitude as to dispel all fears of a repetition of last season's poor lake business and rates. One of the heaviest and most careful Iron men told your correspondent to day that a truthful estimate of Lake Superior Ore sales thus far is 3,000,000 tons. But few charters have been made the past week, and those at about the same rate, viz: Ashland, $1.25; Marquette, $1.15; Escanaba, $1.05. The removal of Ore from the docks to the furnaces continues without interruption, but the demand for mill Iron is at present light and is likely to be for several weeks to come.

Pig Iron. — There is practically no change in the market since last week. The greatest inactivity prevails and just now there seems no likelihood of an immediate brace. The prices are ruinously low and it is said that the few sales recorded were below cost Furnacemen are doing this for various causes among which are the holding of their own trade, keeping out Southern Iron and in the hope of turning the tide of business to a better channel.

Scrap —The market is still a little dull. No. 1 Railroad Wrought is selling at $18.50 @ $19, and Cast Scrap brings, rather weak, $13 50.

Old Rails.—There is no strength in the market. Only two or three sales are reported at $22.

Manufactured Iron.—There is a good demand, with orders increasing daily. Common Bar is sold at 1.65¢ @ 1 75¢ Structural Iron is now in increasing demand.

Nails —The Hardware trade is a little lighter than a week ago. Nails, Steel Cut, bring $1.65 and Steel Wire, $1.80.

The Maryland Steel Company are offering for subscription to their stockholders $2,000,000 5 per cent. bonds, guaranteed by the Pennsylvania Steel Company.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, March 2, 1892.

Trading in Scotch Warrants has been more active since the London syndicate relaxed their hold upon the market, and a very fair amount of business has taken place on an average of 40/4½, although consumptive demand is still rather slow and the export movement backword. Cleveland Warrants have also improved under more liberal dealings, advancing to 36/1½ with moderately active business. The upward turn is attributed chiefly to threatened labor difficulties and rumors that several large concerns have given notice of stoppage of operations during the fortnight commencing with the 12th inst., when trouble with the colliers is expected. Hematite warrants are also higher, selling up to 46/ on rather more active trading. Stocks in warrant stores remain almost stationary. Latest returns give 501,000 tons Scotch and 160,000 tons Cleveland.

Pig-Tin prices moved up early in the week to £89. 10/ for prompt delivery, but subsequently receded, although spot stocks are well under control and firmly held. The consumption is represented as being good and the offering is reserved.

The Copper Market has been firm, with sales of Merchant Bars at as high as £44.10/. Good buying of forwards has imparted some confidence, but this demand has been taken advantage of by holders willing to secure profits. Outside speculative interest is still of moderate proportions. Business in Furnace material has been on a large scale, including contracts for 9000 tons Anaconda Matte, deliverable 1000 tons per month, at a sliding scale of prices to be governed by the movement in selling prices of Merchant Bars. It is reported that a French syndicate is forming to acquire Anaconda Mine properties and should the project be successfully carried out the affairs of the company will be controlled by an Anglo-French board of directors.

For Tin Plate there has been a more active inquiry and a better business is reported, chiefly in light-weight Cokes. Sellers are more inclined to book orders at late rates. The Old Lodge Works are about to close down, owing to lowness of prices, and it is estimated that one-fourth of the Tin Plate mills of the country are now idle.

Scotch Pig Iron.—Makers' iron finds moderate sale, and prices for most brands are still in buyers' favor:

No. 1 Coltness,	f.o.b.	Glasgow	53/
No. 1 Summerlee,	"	"	50/6
No. 1 Gartsherrie,	"	"	50/
No. 1 Langloan,	"	"	51/6
No. 1 Carnbroe,	"	"	44
No. 1 Shotts	"	at Leith	52/6
No. 1 Glengarnock,	"	Ardrossan	51/
No. 1 Dalmellington,	"	"	48/
No. 1 Eglinton,	"	"	47/

Steamer freights, Glasgow to New York, 1/; Liverpool to New York, 7/6

Cleveland Pig.—Makers are firmer in their views, owing to better market for warrants, and hold firmly at 36/3 for No. 3, f.o.b. Middlesborough.

Bessemer Pig.—Demand has been rather more active, and prices are steady at 48/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—Only a moderate business passing, and the demand slow. English 20 % quoted at 80/, f.o.b. shipping port.

Steel Rails.—The demand has not been as good this week as it was last, but prices remain steady. Heavy sections quoted at £4. 5/, f.o.b. shipping port.

Steel Blooms.—Very quiet market, and no change in prices. Makers ask £4. 5/ for 7 x 7, f.o.b. shipping point.

Steel Billets.—The market is steady, but demand continues slow. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Slabs —Very quiet market, and makers' prices unchanged. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—There is only a moderate business, and former prices prevail. Tees quoted at £2. 17/6 and Double Heads at £3, f.o.b.

Scrap Iron.—The market is steady, with demand fair. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Market remains quiet and without change. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Tin Plate.—Slow market and prices without change. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/ @ 14/6
IC Bessemer Steel, Coke finish	12/6 @ 12/9
IC Siemens " " "	12/9 @ 13/
IC Coke, B. V. grade 14 x 20	@ 12/6
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—No improvement in the demand or change in prices, but market easy. We quote, f.o.b. Liverpool:

	£	s.	d		£	s.	d.
Staff. Ordinary Marked Bars	8	10	0	@			
" Common "	6	10	0	@	6	12	6
Staff. Bl'k Sheet, singles	7	10	0	@			
Welsh Bars (f.o.b. Wales)	5	10	0	@			

Pig Tin.—Market firm to-day, particularly for spot stock. Straits quoted at £89. 5/, spot, and £89. 10/ for three months.

Copper.—The market a shade easier to-day and quieter. Merchant Bars quoted at £44, spot, and £44. 12/6, three months' futures. Best selected, £48.

Lead —Demand has been fair and the market steady at £10. 15/ for Soft Spanish.

Spelter.—Demand has been slow and prices are easier at £21. 2/6 for ordinary Silesian.

At a meeting of the Pittsburgh committee of the freight agents representing the various railroad lines entering that city, held there last week, the rail and lake rates from Pittsburgh territory to Detroit were arranged in anticipation of the opening of spring navigation. The rates agreed on were 31, 28, 20, 14, 13 and 11 cents per 100 pounds for first, second, third, fourth, fifth and sixth classes respectively. As compared with the rates inaugurated at the opening of navigation last year, this is a reduction of 3 cents per 100 pounds in the first and second classes, 2 cents in third and 1 cent in fourth, fifth and sixth classes. It is expected that the first boat will leave Cleveland for Detroit about March 10, but as the weather may interfere and render the date of starting uncertain, no time for the taking effect of the rates which apply to Pittsburgh and Pittsburgh territory was set.

HARDWARE.

Condition of Trade.

THERE HAS BEEN some improvement in the demand since our last review of the market, and our advices from different sections indicate that a fair business is in progress. The condition of the roads in many parts of the country interferes somewhat with business, and the absence of the usual orders from the South is felt. The present demand is referred to as embracing assorted goods, including both Shelf and Heavy Hardware and related lines. Dealers are purchasing for their early requirements, and in some cases covering their needs in staple goods for some months to come, but such orders are placed with caution, as notwithstanding the low prices which are ruling there are not as yet indications of an early recovery in the market. Prices on the whole are steady, and manufacturers are maintaining quotations quite firmly. Collections on the whole are good, but are sluggish and difficult in some parts of the Southern States. The special features of the principal Hardware centers are alluded to in the letters given below from our special correspondents.

Chicago.

(*By Telegraph.*)

The Shelf Hardware trade is reported to be quite good in the main, but there are important localities in which business is affected by the wretched condition of the roads. We are likely to hear more or less complaint on this score for the whole of March. Excellent orders are being received from the territory adjacent to the Canadian border, which is now feeling the full effect of the recent good crops and is not suffering from the mud embargo. The heavy Hardware trade is more active than shelf. The small manufacturers and consumers of Iron and Steel are thus shown to be quite busy. Orders are coming in freely for Iron and Steel, and especially for Wagon and Carriage stock, from all sections of the Northwest. A single inquiry last week covered 2000 sets of Carriage Axles. The jobbers who make a specialty of Tinware and House Furnishing goods are complaining of their trade to some extent, but look forward to a very busy time before the month ends.

St. Louis.

(*By Telegraph.*)

The demand for Hardware continues to keep up fairly well. The volume of trade is not as large as was anticipated, however, but the frequent changes of weather which have taken place in the last few weeks have made the country roads almost impassable, and country dealers are only ordering in limited quantities and are holding back their heavy orders until they are in position to handle the goods. Prices in nearly every line are gradually getting lower, and in some cases prices have been made that would not have been thought of a few months ago. The general outlook, however, is considered encouraging, and there is likely to be a change for the better before long. There is no special movement in any particular line of goods, with perhaps the exception of Builders' Hardware, which is ordered in good quantities.

Cleveland.

THE W. BINGHAM COMPANY.—Nothing special to report, except that all houses here are very busy with spring assortments. Most of the country retail dealers have finished their inventory. Their stocks are light, and they are sorting up with all kinds of shelf Hardware, giving quite liberal orders. The demand for barbed and plain Wires in this section is very good. Steel goods, Shovels and Spades are in good demand. Mills are holding Wire Nails firm at $1.75 in carloads, and $1.80 for less quantities. The city trade is quiet. Collections are good, and everything points to a healthy trade this spring.

Baltimore.

CARLIN & FULTON.—While according to the calendar spring has come, the thermometer hardly confirms the statement; but we notice an increasing demand for such goods as will soon be needed in preparing for the crops of 1892. All kinds of gardening tools and plantation supplies are moving, though not aggregating the same volume of business as in previous years. In the cotton States the condition is about the same as last reported, though one of our salesmen writes that in the section in which he was then traveling he was glad to report, if not a better price for cotton, at least a better feeling among the trade, as the people, like the old woman's eels, had about gotten used to being skinned. It is undoubtedly a great hardship that after all the outlay of money and labor to produce a crop the unfortunate farmer throughout the South should find that, while his efforts have been rewarded by an abundant crop, its market value is so little that he can hardly pay for the fertilizers used in raising it, and that the labor of a year has gone for nothing. We are glad to say that all sections are not affected in this way and that in the grain growing States there is not so much to be complained of, considering the season of the year. There is an active demand for Barb Wire, stimulated possibly by its low price, and the sale of Galvanized Poultry Netting is quite lively, in anticipation of the time for spring chickens. The festive mosquito and the buzzing fly are also factors in the Hardware business, as is shown by the inquiries for Wire Screens, Doors, Spring Hinges and Wire Cloth. Many orders are also being placed for Ice Cream Freezers and Preserving Kettles, for which there will no doubt be a good trade this year, though we regret to have read in one of our papers the usual information in regard to the peach crop, that most of the buds, it is now discovered, were killed last November. This news would be of a much more mournful nature were it not that we have had to lament over the same misfortune every year. Remittances are fairly good with the exception of the one section, the South, in which there is so little at present to realize money upon.

Louisville.

W. B. BELKNAP & CO.—Business at last begins to show marked improvement. This is not the result, however, of any advance in prices, or artificial stimulus of that kind, nor the laying in any new stocks, nor the undertaking of any new enteprises, but from a widespread moderate demand from consumers who have been economizing till their old supplies are exhausted and they have saved up money to buy new. The effect of this enforced economy, shown in better collections from most sections, is fewer complaints of the condition of affairs. During a year or more of liquidation a great many concerns have gone out of business, their stocks have been absorbed by their neighbors and by these distributed, so that from now on we may reasonably look for expansion rather than further contraction. There is an encouraging demand for farm tools and implements of all kinds, fencing material, &c. The farmer goes into this year with the rewards of last year's good crops available in bank or stored away in that favorite receptacle, the old sock in the bureau drawer at home. At any rate his credit is not bad, and the prospect is that unless it be in the district altogether dependent on the cotton crop, he will be able to buy what he needs for the present season's operations. At the same time, the productive capacity of the country is not fully employed and there is scarcely any gleam of hope in the horizon for improvement in prices. One of the untoward elements in the cities has been the large fires, entailing immense losses to the insurance companies and the property owners. Louisville, Memphis, Nashville, New Orleans and places intermediate have suffered very heavily in this particular. The report in this week's *Iron Age* of the Hardware dinner will be of general interest to the trade throughout the country. Even the diagram of the tables with the individual sittings will doubtless be referred to year by year. The spirit with which this entertainment has gone off will lend life to the proposed establishment of a Hardware club in New York. Certainly if all the allied branches of trade will join in there

should be no trouble in getting up an ample membership; and since the strict rulings against all things foreign have been put in force, it suggests the propriety of a meeting place and lunch house savoring less of Bohemia than those commonly patronized within the Hardware territory of Reade, Chambers and Duane streets.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—The conditions prevailing in Omaha are much the same as have characterized trade for some weeks past. Jobbers have plenty to do, and are generally well satisfied with the present demand for goods, and with the general volume of business transacted since the advent of the New Year. Orders from the country cover a well-assorted line of goods, showing that merchants are alive to the situation, and that they have confidence in the future. Prices are practically unchanged, and the market is firm, with no disposition apparent to shade legitimate values. The outlook for the coming spring business still retains its flattering aspect. There appears to be very little difference of opinion as to what the future will bring forth, and business men from Omaha to 'Frisco seem to be thoroughly imbued with a feeling of confidence. Referring to city trade, the movement of goods in a retail way is not quite all that could be desired, but it is almost too early in the season to look for any great improvement. The coming of warmer weather, with the increased demand for labor for carrying on the various building operations now under contemplation, must soon have a stimulating effect on local business. We regret to note that there is one large section of the country that does not seem to share in the otherwise general prosperity. We refer to the cotton States, where the present low price of the staple crop gives little promise of a prosperous trade.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Trade since our last report has been fully up to expectations. The weather has not been severe. There was quite a rainfall a few days ago, which is a rare occurrence with us, and this has been followed by mild weather, so that trade has not been obstructed by snow blockades, which are most to be feared of all other things in the obstructing of trade during a severe winter. On the other hand, country roads have not been good either "for wheels or runners," so that country trade has been light. The worst feature of continued mild weather at this season is its possible effect on the lumber interest, which is a very large one here. A cold winter with plenty of snow is the lumberman's delight, as it enables him to get his logs to the mill or where he can expect to market them in the spring or early summer. It is still probable that the winter will hold sufficient grip to enable lumbermen to get out about the average number of logs, and if so this will be all that is needed to have that important interest in good condition. Other branches of trade are moving along about as usual. On prices in Hardware there is nothing special to note. Barb Wire continues a little weak, but the tendency toward softening of prices does not indicate any considerable decline, though on the whole the Wire market is not satisfactory. Nails are now holding firm, and "no advance seems to be in the air."

Collections are fair, and as we approach spring the prospects for business are favorable.

New Orleans.

A. BALDWIN & Co., LIMITED.—The quiet tone still pervades business in this section of the country. The usual flutter attending our Carnival festivities pervades the trade locally, but buyers are not so plentiful as in former years. A great many strangers are visiting this city, but they are evidently bent on pleasure more than for business. The past few weeks has shown a slight improvement, but we would like to see it much better.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues without any material change in volume or excitability. The usual amount of Hardware is being distributed, with margins of profit, especially on leading goods, infinitesimally small. It would seem almost as profitable to sell old gold dollars for new ones as it is to sell Wire and Nails at the present time. The idea of buying from 100 to 1000 tons of Barb Wire in order to secure a very fine percentage below the market rate and then market it out in 1 or 2 tons at a margin of 10 cents per 100 pounds, a couple of years ago would have seemed ridiculous; or to buy Wire Nails in lots of 2000 to 5000 kegs and market them in small lots at 10 cents per keg advance, a few years ago would have been considered suicidal business management. Yet this is just what we are doing in the year 1892. On other leading lines of Hardware the margins of profit have been gradually narrowed down the past year. It has been a continued clipping of the edge, like whittling a stick, upon which continual cutting and clipping eventually reduces it to a toothpick. Almost every year at about this date there is a lull in trade for a few weeks, not because there is any discouraging outlook, but owing to the fact that it is usually the case immediately after the first of the year. People as a rule wait for something to "turn up." At present the outlook is good, and at present we are still being benefited by the misfortunes of those in foreign countries. From depression of trade in Great Britain certain kinds of goods have been marketed into this country at lower prices than heretofore. Large numbers out of employment in Germany, owing to their diminished export trade, and the failure of crops in Russia, have all had their natural effect upon this country. Toward the last named country our own country has thus far displayed a most magnanimous disposition to contribute a portion of the gains made, owing to the misfortunes of others. We look for quite an improvement in trade, beginning with about this date.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—The condition of trade in this section is not as yet particularly encouraging, although there is a noticeable improvement since our last report. The changeable weather interferes with building, and there has been very little new work started for some time, and then, too, the demand for houses is not as great as it was in the city, on account of the large number built last season, stimulated, no doubt, by the extremely low price of lumber. Staple goods are still being sold altogether too low considering the cost of manufacture. The local Cordage Factory issued a card on the 18th ult., showing an increase in the price of Duplex ½ cent per pound, and the addition of Sisal, which had not been made here for some time.

Collections are yet poor. This by some is attributed to the fact that borrowers are holding off in hopes of securing a lower rate of interest than last year.

Notes on Prices.

Cut Nails.—The Cut Nail market continues only fairly active and without any special life. Prices continue as before, with no quotable change. They are on the basis of $1.45 at mill for either Iron or Steel Nails in round lots, a figure which is only slightly shaded in special cases. New York quotations are $1.55 to $1.60 on dock, small lots from store being held at $1.65 to $1.75.

Chicago, by Telegraph.—Cut Steel Nails are being sold by manufacturers at $1.60 to $1.65 on 30 cent average, with a sufficient run of orders to keep the local makers busily engaged, but the volume of trade is not large enough to make the Northwest a very inviting field just now for outside concerns. Jobbers continue to quote $1.75 from stock.

Wire Nails.—Since our last report the Wire Nail market shows no improvement, and there are indications of a slight weakening, as prices are obtainable now which were not within the reach of buyers a week or ten days ago. The goods are evidently sympathizing with the condition of the Wire market as a whole, and the low prices of the raw material have some effect in producing the slight weakening which is perceptible. The current price is $1.75 for carload lots at mill, with 5 to 10 cents advance in smaller quantities. The volume of business is fair, and sales aggregate a considerable quantity of Nails.

Chicago, by Telegraph.—Wire Nails are being sold by manufacturers to some extent, but they are not receiving enough orders to make business active. They held a meeting last week and reaffirmed prices. It is stated that from reports made at the meeting their contracts are in considerable excess of the Nails on hand. Prices are sustained fairly well at $1.90 for mixed carloads and $1.95 for small lots.

Barb Wire.—The condition of the market is not materially different from last week, but prices have perhaps settled

to a point a shade lower. As a general quotation $2.65 for carload lots for Four Point Galvanized at mill may be named, but this figure is shaded a little more freely than a week ago. There is also an evident disposition to diminish the difference beeween the Galvanized and Painted Wire, and the regular advance of 50 cents for Galvanized on the price of Painted is not always adhered to. There is some difference in the prices named by different manufacturers, some of whom refuse to meet the extreme quotations current. New York prices for local trade are on the basis of $3.10 for small lots of Four Point Galvanized, carload lots being held at $3, and these figures are pretty well maintained for business in the vicinity.

Chicago, by Telegraph.—Barb Wire is to all outward appearances quite steady, manufacturers reporting their usual quotation: $2.45 on painted and jobbers', $2.55 on carloads, with 40 cents per 100 advance on galvanized. Small lots from stock at $2.60 and $3.10 respectively.

Wire.—Somewhat lower prices than have been current are now ruling in the market for plain Wire, and the market is not in a satisfactory condition. There is some uneverness in the figures quoted by different manufacturers, but there has been a gradual revision of prices, which are now lower than heretofore.

Tackle Blocks.—The revised prices on Tackle Blocks are referred to as well maintained. It is understood that the manufacturers have reached a satisfactory arrangement by which the control of the market is secured.

Rules.—The improvement which we have recently noted in the market for Box wood Rules still continues, and nearly all the manufacturers are asking somewhat higher prices.

Lalance & Grosjean Mfg. Company.—In connection with their new catalogue, to which we have already referred, Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, issue the following discount sheet, terms 60 days or 2 per cent. discount for cash in ten days:

	Per pound.
Planished Brass Kettles	Net.
Copper Stock Pots	Net.
Copper Saucepans	Net.
Agate Iron Ware	33⅓ %
Blue and White Enameled Ware	33⅓ %
Milk Cans	70 %
Laundry Tubs	33⅓ %
Sinks, with Brass Couplings	33⅓ %
Kitchen Sinks, with Cast Iron Couplings Plumbers' Bowls Pantry Sinks	50 %
All goods in list marked with an *	70 %
Everything else in list	70 %

Leffingwell's Wire-Back Towel Roller.—This article, which is manufactured by Chas. Leffingwell, 55 Eighth avenue, Newark, N. J., was described in a recent issue, and is sold at the following prices, f.o.b. cars, Newark, 5 per cent. off cash after receipt of goods:

	Per dozen.
No. 1	$0.75
No. 2	2.00
No. 3	2.50
No. 4	3.00

In a circular relating to the Towel Roller the manufacturer gives a list of sample orders in which the goods are furnished with prices. Thus a quarter dozen each of sizes Nos. 1, 2, 3 and 4 can be obtained for $2.06.

Building Paper.—In response to a request from several of our subscribers we give below prices on Building Paper. C. B. Hewitt & Bros., 48 Beekman street, New York, quote from their extensive line the following prices in ordinary lots:

	Square feet of Surface to 1 lb.	lb
Venetia Red Rosin Sized Sheathing, 36-inch Rolls	8	3¢
Venetia Red Rosin Sized Sheathing, 36-inch Rolls	12	3¢
Cottage, Red Rosin Sized Sheathing, 36-inch Rolls	8	2¾¢
Cottage, Red Rosin Sized Sheathing, 36-inch Rolls	12	2¾¢
Plasterboard, Rosin Sized, 36-inch Rolls (1000 square feet)	8	$5.00
Red Rope, No. B, Hard Sized, 36-inch Rolls	16	12¢
Red Rope, No. B, Hard Sized, 36-inch Rolls	20	12¢
Red Rope, No. B, Hard Sized, 36-inch Rolls	25	12¢
Red Rope, No. B, Hard Sized, 36-inch Rolls	30	12¢
Sackett's Sheathing, No. A, 36-inch Rolls, each roll contains 1000 square feet		$2.25 roll
Sackett's Sheathing, No. B, 36-inch Rolls, each roll contains 1000 square feet		2.00 roll

	Square feet to 1 lb	Per 1000 square feet
No Noise Felt, 36-inch Rolls	4	$10.00
No Noise Felt, 36-inch Rolls	8	8.50
No Noise Felt, 36-inch Rolls	10	8.00
Norwich Patented Floor Deafener		1¢ square foot
Handy Roofing Felt, 1 Ply Tarred, 32-inch Rolls, each roll contains 300 square feet		2¢ lb
Handy Roofing Felt, 2 Ply Tarred, 32 inch Rolls, each roll contains 100 square feet		$1.00 roll
Handy Roofing Felt, 3 Ply Tarred, 32-inch Rolls, each roll contains 100 square feet		$1.25 roll

Their Neponset papers in lots of $50 worth or more at a single delivery are quoted at the following prices, terms, f. o. b. New York, net 30 days:

No. 1 Red Neponset Rope Roofing Fabric, per roll of 500 square feet	$4.20
No. 1 Red Neponset Rope Roofing Fabric, per roll of 250 square feet	2.15
Black Neponset Waterproof Building Paper, per roll of 500 square feet	1.45
Black Neponset Waterproof Building Paper, per roll of 250 square feet	.75

Perkins' Horseshoes.—Rhode Island Perkins' Horseshoe Company, Providence, R. I., under date February 16, withdrawing former quotations, announce that freight on their XL Steel and Toe-Weight Shoes will be equalized with the Troy tariff rate at time of shipment. They also announce the present price of their Perkins' Latest Improved Snow Shoes as 4¼¢ per pound, f.o.b. Valley Falls, R. I., discounts and terms remaining as per their circular, January 21, 1887. Under date February 25, they state that the present price of the Perkins' Steel Side-Weight Hind Shoes is 7½¢ per pound, f.ob. at mill, with discounts and freight allowance same as upon Toe-Weight Shoes.

Glass.—The Glass business has not been active enough since the advance was made in the price of American Glass to indicate how nearly the market price is kept to printed quotations. There does not appear to be so perfect an understanding among Eastern manufacturers as the Western manufacturers claim to have reached. A meeting held in New York on February 26 by a committee of Western manufacturers and New Jersey manufacturers resulted, as far as has been learned, in no agreement as to uniformity of prices. The price at which imported Glass is being sold unsettles the Eastern market to a considerable degree. It is reported that, through some disagreement among Boston importers, foreign Glass is being sold at 80 and 10 and 5 per cent. discount, which is the same as the 1000 box price for American Glass. It is surmised that Glass importers and the committee of American manufacturers are working in harmony on the revision of the price-list of Glass, and that the two lists will be uniform, as they are at present. Should this be the case, importers would probably give their best customers an opportunity before the new list went into effect to contract for Glass for at least six months ahead on the old list. Quotations are as follows: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Exhibits at the World's Fair.

THE Hardware Board of Trade, 4 and 6 Warren street, New York, James H. Goldey, treasurer, have received from the Director General of the World's Columbian Exposition, Chicago, a full set of rules and regulations, together with full information for the guidance of intending exhibitors in filling out and presenting their applications for space in a proper and intelligent manner. The general reception of articles at the exposition buildings will commence November 1, 1892, and no article will be admitted after April 10, 1893. It has also been determined that space not taken possession of by April 1, 1893, will revert to the Director-General for re-assignment. The official pamphlet relating to classification and rules in connection with the exhibit of manufactures gives full information in regard to the matter, and contains the regulations under which exhibits are to be made. It is requested that prompt application for needed space be made, so that assignments may be determined without delay. Exhibitors will not be charged for space, nor for a limited amount of power. Blank applications for space, containing also rules and regulations, thus giving all needed information, can be obtained on application to the Hardware Board of Trade, as above.

W. W. LAWRENCE & Co., Pittsburgh, Pa., in a circular to the trade, state that they continue as wholesale selling agents for Whiting's Brushes, reports to the contrary notwithstanding. They caution their trade not to be misled by misrepresentations, and suggest the desirability of buyers sending for their catalogue and prices before ordering.

ANNOUNCEMENT.

THE IRON AGE DIRECTORY.

In view of the need which has long been recognized of a directory of manufacturers in the Iron, Hardware, Metal, Machinery and other trades, we have the pleasure of announcing that we have entered upon the preparation of such a work, and respectfully solicit the co-operation of manufacturers in giving us information in regard to their products.

We shall esteem it a favor if they will send us at their convenience printed matter (catalogues, circulars, price-lists, etc.,) indicating the lines of goods they are manufacturing. This will assist us in the preliminary work connected with the compilation of such directory.

It is intended to make the directory exceptionally complete and accurate, and manufacturers may be assured that the proper representation of their goods (entirely free from charge) will receive careful attention. Our aim is to make the work of the greatest value to all in the trades to which it relates, and in order to render it as convenient for use and reference as possible special attention will be given to its arrangement and classification.

We desire to emphasize the fact that no charge will be made either directly or indirectly for the insertion in the directory of the names of manufacturers duly classified under the proper headings.

It is obvious, as the work will be given a very wide circulation, that it is to the interest of manufacturers to be adequately represented in it, and to this end to furnish us with information in regard to their products. We trust, therefore, that the printed matter requested above will be sent at an early date, and in order that it may be received promptly and apart from our regular mail, it should be addressed as follows:

THE IRON AGE,
96-102 READE STREET,
NEW YORK.

DIRECTORY DEPARTMENT.

We shall at the same time be glad to receive any information or items in regard to any matters of trade interest of which use can appropriately be made in the editorial columns of THE IRON AGE.

Very respectfully,
DAVID WILLIAMS.

A National Hardware Gathering.

AS THE TRADE look back upon the late Hardware dinner in New York, they are enabled the better to appreciate not only the great success which attended it, but also the extent of the Hardware interests represented in it. It was in fact, without doubt, not only the largest Hardware dinner, but also the largest representation of Hardware interests in the history of the country. With the changes which during recent years have taken place in trade methods, there has been a diminishing in this and other markets of jobbing interests as compared with the growth of manufacturers and the development of agencies. But at the late dinner, in addition to the jobbing interests of New York and other Eastern cities, there was an imposing representation of manufacturers, the largest in the country being present, and a great number of others who are prominent and influential in trade circles, and whose goods are known throughout the length and breadth of the land. In view of the vast interests thus represented the 1892 dinner was very much more imposing as a representation of the trade than that of 1860. While the gathering recalled the great changes which have taken place in the character of the Hardware trade of the city, it also served to impress upon all observers the growth of the city's Hardware interests, and the position of New York as the great Hardware center of the country.

While the gathering was thus the largest in the history of the trade, it is to be borne in mind that it was after all local in its scope, no effort having been made to secure a general representation of other Hardware centers. This was obviously out of the question, inasmuch as early in the movement it was perceived that the trade centering in New York would fill to overflowing the largest banqueting hall available. Very much would have been added to the pleasure and impressiveness of the gathering if it had been feasible to have had representatives from the chief manufacturing concerns in other parts of the country, as well as from the jobbing houses in the different Hardware centers, through whom such vast quantities of goods are distributed to the trade at large.

In view of the success which attended the late dinner we trust that the trade in other sections will be stimulated to meet together in a similar manner for the cultivation of the spirit of fraternity and cor-

diality in connection with business affairs. There is little doubt that similar dinners might be given in leading centers, and be made occasions which would be very enjoyable as the trade were brought in closer relations with one another. At the same time, incidental advantages would unquestionably result, and the foundation might be laid in some cases for concerted action for the promotion of their common interests.

The needs and opportunities of the trade, however, in this direction will not be fully met by local gatherings, no matter how pleasant or successful they may be. It is desirable that there should be a national assemblage as representative of the entire jobbing and manufacturing interests of the country. At such gathering the attendance of the largest houses could unquestionably with proper management be secured, with a host of merchants and manufacturers with whose names the trade are familiar, and an assemblage would thus be brought together which would represent the trade of the entire country and eclipse the success of even the recent banquet.

New York would doubtless take pleasure in extending the hospitality of the city to such a gathering, but in view of the approaching World's Fair and the central position occupied by the city, Chicago is unquestionably the location where with most propriety such a banquet should be held. We therefore leave with the trade the suggestion of the desirability of such a national assemblage at Chicago in connection with the World's Exposition, or at an earlier date, as may seem most advisable. The splendid enterprise of the city and its merchants would be an assurance of success in a matter which would appeal so favorably to the trade at large.

Trade in Louisville.

FROM A SPECIAL correspondent we have the following advices in regard to the condition of trade in Louisville, Ky.:

The Hardware trade of Louisville, Ky., is now more brisk than for many moons. The shipping floors of the big jobbers look unusual in the large amounts of goods going out. For a year or more the country merchants' orders have been closely scrutinized and cut down by the dealers, because every one knew they, as a class, were in a bad fix, and many were the failures noted among them. At last, though, money has reached them, that salve for "cramps," and the jobbers, getting more confidence in their country cousins, are filling orders full, and are in turn receiving good remittances on accounts. There are certain sections of country that our far-reaching distributors are very chary of, until they shall have been able to restore confidence in themselves, but even in those depressed cotton regions, where money is so scarce, the coming of spring weather or some influence is having a genial effect.

Agricultural Implements, of course, form a large portion of the shipments at this season of the year, but a casual glimpse of the shipping floors show a general assortment of Hardware going out. Many houses report double the quantity of goods being shipped now over a month ago. All lines of building material are extremely low; Lumber, like Iron and its many products, never reached such depression. There have been many disastrous failures in Lumber all through this section during the past 12 months. Those mills that can make such arrangements are warehousing their product on their yard and getting money from the city banks to continue operations. The insurance companies fare well on these deals, as the rates are high. Other building material, such as stone, beams, Nails, &c., are also accumulated in large quantities at cheap prices, putting the country in good fix for a building boom—if it comes.

The farmers are getting their supplies for improvements at low cost, too, both Barbed and Plain Fence Wire being at the lowest point ever reached. The manufacturers of Barbed Wire, realizing that the best part of the year for them is fast going by, are making strenuous efforts to sell their product. Both Bar and Sheet Irons are remarkably firm, the mills having good orders booked ahead. Wire Nails are now firm at last from the mills. A large product is going out, and if present agreed prices are adhered to it will give the manufacturers a chance to make some money. The Cut-Nail men are much more demoralized, a few of the mills apparently finding it necessary to cut prices down to nothing in order to make sales. This has been the case of some well-known brands of Nails in this territory.

CYCLES.

THE INTEREST in Bicycle riding shows no decrease, but, on the other hand, the larger demand for wheels in 1891 justifies the increased facilities which have been provided by manufacturers for turning out machines for the coming season, as well as encourages new companies who have entered the field.

The larger proportion of manufacturers, not content with former achivements, have improved their machines, and many have augmented their line of wheels by entirely new productions. Most of the manufacturers recognize the fact that Hardware merchants are the best ones to handle their output, being a more desirable and responsible class to deal with than other agents. Foreign manufacturers are exerting themselves to hold and increase the trade already established for their wheels on this side of the Atlantic. The following outlined prospectus of what some of the manufacturers have in hand for 1892 may be of service to the trade in making selections for the coming season.

In our next issue we will continue this subject, giving additional information as to the machines which other manufacturers will have on the market for 1892.

HULBERT BROS. & CO., 26 West Twenty-third street, New York, offer a large assortment of wheels for 1892. Their line comprises both American and English makes; and they are presenting to the public their Majestic Safety, a machine of their own manufacture. It is referred to as being as high grade machine as is manufactured, made from the best of weldless steel tubing and steel drop forging; is full ball bearing; has rear brake, 1¼ inch cushion tires, and is fitted with pneumatic tires as well. The fact is emphasized that this machine is strictly high grade.

The King of Scorchers is an exceedingly light wheel of English construction, but owing to the invention of a pneumatic tire with which this machine is fitted, they guarantee it to carry 200 pounds over any roads. The Queen of Scorchers is of the same high order as the King of Scorchers, having the latest improvements for ladies.

The Eagle Safety is new to the market this season, and is one of their collection made by the Eagle Bicycle Mfg. Company, whose wheels are noted for their finish.

The Lightning, Manhattan, Rapid and Greyhound form their line of cheap ball-bearing cushion tired machines, and is referred to as an exceedingly fine line of machines for boys and cheap grade of men's machines.

Their line of Swifts consists of seven different styles, varying in price and weight, and having several different styles of tires.

The Tuxedos, Nos. 1, 2 and 3, are made of endless steel tubing and forgings, ball bearings throughout, including head, 1¼-inch cushion tires, single tangent spokes, crossed and tired, all with Garford saddle. The King of the Road has 27-inch wheels, solid tire, cone bearing, direct spokes, and is referred to as most serviceable for a low-priced wheel.

They are also bringing forward this year an article in the way of a Bicycle Trouser Guard, which recommends itself greatly for wheelmen's use, it being adjustable, extending clear around the trouser, thus preventing its working loose or becoming lost.

They are also introducing their Majestic Wrench. This Wrench is not only designed for Bicycle use, but for pocket use as well. It is a 5-inch Wrench, but, it is stated, owing to skillful forging, it is no heavier than other 4-inch Wrenches.

The marketing of their Bicycle goods is done through regular established agents, and they are desirous of covering the territory with agents as thoroughly and completely as possible.

ROUSE-DURYEA CYCLE COMPANY, Peoria, Ill., have for their new machine for 1892 their Diamond Spring Frame Sylph, which embodies their three-part frame with the diamond shape. Their drop frame machine for 1892 will be virtually the same as their 1891 machine, the changes all being in minor details. The manufacturers state that although this machine was only placed on the market at comparatively recent date, its reception has been most favorable. Their machines will be furnished with solid, cushion or pneumatic tires. In cushion tires they will furnish either the regular cushion or the Duryea Crescent; the latter, it is stated, is lighter and stronger than ordinary cushions, and is guaranteed by them to stay in the rim.

POPE MFG. COMPANY, 221 Columbus avenue, Boston, Mass., issue an artistic 1892 catalogue, which is their fifteenth annual greeting. Illustrations are given of the Century Columbia, Columbia Light Roadster Safety, Columbia Ladies' Safety, Columbia Light Roadster, Columbia Semi Roadster, Expert Columbia and Volunteer Columbia. They state that improvements in this season's machines are shown in the saving in weight, of which the Century Columbia is a marked example, in brake construction, which has been so improved as to make it much lighter in weight and more positive in action, and in addition to this a sheet steel brake spoon has been adopted. They are now making their machines with dropped handle bars, which is considered an improvement.

The Columbia pneumatics, which are fully warranted for a year, are a very marked improvement in the way of tires. There is also an improvement in the saddle adjustment over that of last year; one small improvement is in the round cranks, the style adopted last year being flat and heavier. The finish has been very much improved this year and is considered by them to be the best on the market, no pains being spared to make it as perfect as possible.

LETTER FROM

Polhemus Lyon, Our Foreign Representative.

WE GIVE BELOW a letter received from Polhemus Lyon, who writes from Bombay, India, under date January 22. It will be observed that in the interesting and graphic communication our correspondent refers to the India market as not as yet offering a very promising field for American Hardware, and the information given in regard to business methods and the condition of things in Bombay will be read with much interest:

BOMBAY, India, January 22, 1892.

To the Editor of The Iron Age: After spending three weeks in this city of over 800,000 people I cannot report any encouraging prospect for American Hardware.

The lines that we could sell here are shut out on account of the lack of freight communication; Russia holds most of the kerosene trade, so that there are but occasional direct shipments from New York, and freight via Europe entails double cost, which completes the barrier for us.

Again, the goods I have seen here are of poorer grade than any I saw in either Japan or China. The shovels sold here cost the native buyers $2.15 per dozen in London. Axes they do not buy in quantity, using chiefly a native adze, with which they are very expert. For hammers they pay $4 per hundredweight (112 pounds). It is needless to add these show on their face where they strike every time. Carpenters get a rupee (about 33 cents) a day, and have not much money to spend for tools.

This seems to be the dumping place for Europe's worse than seconds—Germany getting, I am told, five-eighths of the business—but H. Boker's goods, which crowd the shelves of South Africa and Australia, are not found here.

There is no European Hardware house in this city. The native merchants in this branch whom I have met are all Mahomedans, and, though I think they understand more English than they will acknowledge, I have had to do all my business through an interpreter, quoting prices in English sterling, with which they are very familiar.

The native commission merchants and the native salesmen of European houses here are usually Parsees, who invariably speak and write English, and are rapidly adopting European manner of living and dress. These native salesmen for European houses are no great burden to the expense account, and since they are too far away to "bear" the home market, I might mention that I know a very capable Parsee chief salesman to a large European concern here who draws $33 per month against a commission of ½ per cent. on his sales, and, unfortunately, has not for a year earned more than his guarantee.

And the commission house has hard lines of it, for a large number of European manufacturers send salesmen here every year soliciting direct business with the native merchants; the middleman is being crowded harder and harder all over the world.

The custom here is for a visiting salesman to spend the morning in the bazars soliciting a visit to his sample room; promises are easily obtained for the afternoon; in fact, on my first day I grew a little worried after more than ten had promised to call that afternoon lest they would crowd each other so that I should fail to effect business. Mr. Parsee salesman smiled at this, and well he might, for not one of those merchants showed up that day at my room. It gets monotonous to spend morning after morning in the bazars obtaining promises, most of which will be broken until they have been repeated several times.

These bazars are novel features. The trades are grouped by themselves, Hardware being divided into more branches than with us, and each branch located in a separate bazar street. The shops are seemingly little stalls off of the street, usually from 10 to 15 feet front by from 10 to 60 feet deep. I found in such a cell a wholesale merchant who has nine "godowns" or warehouses and could any time fill an order for 10 tons of bolts and for large quantities of machinists' hammers or straps and Ts. In most of these there is no privacy possible, for the competitor next door sees every visitor and can easily know what is going on.

Several buyers have not hesitated to offer me their invoices to look over, which is a very convenient way of getting at the bottom facts, not always either, for I learned where an exporter made under agreement a draft for so much less than the invoice, but when the draft is exhibited one gets there all the same.

India is a free port for Hardware, always excepting munitions of war, on which there are almost prohibitive laws.

Trade Items.

NORWICH LOCK MFG. COMPANY, Roanoke, Va., in their advertisement on another page announce that their new catalogue and price-list is now ready for distribution. It contains illustrations and descriptions of the very complete line of Locks, Knobs, Keys, Escutcheons, Bell Pulls, Padlocks and Builders' Hardware which this company are putting on the market. Particulars as to the manner in which these catalogues will be distributed are given in the advertisement.

THE COMPANY who will manufacture blue and white Enamel Ware at Dubuque, Iowa, will be known as the Falkenhainer Company. A charter to incorporate has been secured, authorizing a capital stock of $50,000. Heretofore these goods have been manufactured in Germany and Austria, but it is stated that last year Dubuque parties visiting Germany obtained the secret of their manufacture and prevailed on one of the workmen employed to come here and start a factory.

IN THEIR ADVERTISEMENT, occupying a page in this issue, the National Saw Company illustrate some of their leading goods and specialties, including Paragon Double Edged Pruning Saw, Champion Adjustable handled One-Man Saw, Holden's patent Nest of Saws and patent Handles of different patterns.

SHROFF & Co., Leesburg, Va., advise us that they have moved into a much larger and more commodious storeroom, where they will handle Hardware more extensively than heretofore. They will be glad to receive manufacturers' lists relating to the goods they are putting on the market.

THE VAN CLEVE GLASS COMPANY, Cleveland, Ohio, are now ready for business in their new block, corner Seneca and Champlain streets, which they regard as a model of convenience and completeness. They advise us that they are carrying a very large stock of Polished Plate Glass, besides which they have a fine stock of Window Glass. The manufacture of Art Glass of all kinds has been commenced on the top floor of their building.

GASTON, WESTON & LADD, 46 Beekman street, New York, report a very satisfactory business in Prestoline, their sales being considerably ahead of former years. They are also in receipt, they advise us, of testimonials which furnish evidence of the growing confidence of the trade in the merits of Prestoline, the excellence of which as a metal polish is emphasized.

ALBERT MCGREGOR, under date December 12, 1892, announces that he has purchased the interest of Clyde Hamilton, his late partner, in the business of the firm of Hamilton, McGregor & Co., 12 Elizabeth street, Hobart, Tasmania. The business will be hereafter carried on under the style of McGregor Bros.

COVERT MFG. COMPANY, West Troy, N. Y., are now calling the attention of the trade to their Covert Thimble with penetrating point for Horse and Cattle Ties. The Thimble is made with a pointed pin or screw, which penetrates or passes through the rope, thus rendering it impossible for the rope to shirr up around the neck of the animal, as is apt to occur with other devices for this purpose. It is referred to as being superior to Thimbles with round or flat end pins to screw against the rope.

IT IS ANNOUNCED that Post & Co., Cincinnati, Ohio, have sold to Dayton Mfg. Company, Dayton, Ohio, their entire railroad business, including Railroad Supplies, Materials, Patterns, Tools, patents and good will. The Dayton Mfg. Company will complete all unfilled orders for these goods.

WE ARE ADVISED by S. A. Haines that on and after April 1 his address will be 604 North Alabama street, Indianapolis, Ind., which will in future be his headquarters. Mr. Haines makes this change for the benefit of the manufacturers whom he represents as well as the buyers who favor him with their orders, as he will thus be nearer to the center of the jobbing trade. Mr. Haines' many friends in New York, while regretting the change, will unite in the heartiest wishes for his success in this new departure. The houses whom he is representing are the following: L. M. Dayton, Cincinnati, Ohio; Logan & Strobridge Iron Company, New Brighton, Pa.; I. S. Spencer's Sons, Guilford, Conn.; Dille & McGuire Mfg. Company, Richmond, Ind.; Schulte, Lohoff & Co., Evansville, Ind.; Wire Goods Company,

Worcester, Mass.; Hatch Cutlery Works, Kensington, Ill.; Starr Bros. Bell Company, East Hampton, Conn.; Lufkin Rule Company, Saginaw, Mich.; New Jersey Brush Company, Verona, N. J.

N. G. LINCOLN has accepted a position with the C. F. Guyon Company, 99 Reade street, New York, as traveling salesman in New York State. Mr. Lincoln has for the past four years been with Babcock & Stowell, Binghamton, N. Y., and resigned his connection with that house on the 10th ult. He is referred to as having gained the esteem of his former employers by his fidelity and trustworthiness, and as possessing qualities which should insure success in his new departure.

THE TRADE will observe the page advertisement of Branford Lock Works, Branford, Conn., in which they illustrate Branford's New Cylinder Rim Night Latch, showing the special features of its construction. They allude specially to the fact that it is non-pickable. The Chicago office of the company, 1311 Chamber of Commerce Building, is in charge of F. G. Draper, formerly of F. G. Draper & Co., who will represent them in the West. Their New York warehouse is in charge of Underhill, Clinch & Co., 94 Chambers street, and their Philadelphia warehouse in charge of Supplee Hardware Company, 503 Commerce street.

H. M. PIERSON and Henry R. Pierson, dealers in Hardware, &c., Pittsfield, Mass., announce under date March 1 that they have admitted as a member of their copartnership Frank E. Pierson, the former firm name of Pierson & Son becoming the Pierson Hardware Company. The business was established in 1853 by Dutton & Pierson, and has been conducted since 1876 under the style of Pierson & Son.

THE CLEVELAND HARDWARE COMPANY, Cleveland, Ohio, whose factory and mill were destroyed by fire on June 6, 1891, issue an attractive pamphlet with views of their plant after its destruction by fire, and also of their new works as completed January 1, 1892. The front cover of their tasty and artistic pamphlet contains simply the following lines:

Out of the old house, Nancy,
Gone up into the new;
All the hurry and worry
Is just as good as through.

Their new buildings are eitheir all iron, or brick and iron, covered with slate roofs, and as nearly fire proof as it is possible to build. They state that they are now in perfect running order, and ready to receive orders.

HOAGUE & PECK are now carrying on the business formerly conducted by J. H. Hoague, at Chicopee, Mass. They will continue the manufacture of the Chicopee Automatic Drill, Scale Chamfer Gauges for Drawing Knives and other mechanics' Tools and Hardware specialties. They are located in their new building with ample room and additional machinery, by which the delays which formerly occurred in filling orders will be avoided. The new firm thus possess excellent facilities for the production of their goods.

W. H. DAVEY has succeeded F. T. Hawkins as dealer in Stoves, Hardware, &c., Maryville, Mo. The change went into effect on January 15.

ON SUNDAY AFTERNOON, February 21, a fire broke out in the grinding shop of Buck Bros., Millbury, Mass., but was soon extinguished. The loss on building, machinery and tools is $3800. We are advised that all the Chisels and Plane Irons that were at all damaged by the fire have been destroyed. The business of the firm was not seriously impeded, as they carry a large stock of finished goods in another part of Millbury, so that they were thus able to fill all orders with their usual promptness. They add that during the past ten days their sales have even been larger than usual.

IN HIS ADVERTISEMENT in this issue, B. Gloekler, 1117 and 1119 Penn avenue, Pittsburgh, Pa., illustrates his Refrigerator Door Fastener, a description of which was given in our columns some weeks since.

OUR ATTENTION has been called by Joseph O. Kerbey, late United States Consul at Para, Brazil, to the fact that reciprocity gives American Hardware manufacturers exceptional advantages in regard to the sale of goods in that country. The result of the present condition of things is that merchants who have previously been purchasing their goods from German and other European countries are now looking about to establish connections with American manufacturers.

WILD & Co., 85 Dearborn street, Chicago, are offering a Combination Barrel Truck and Rack, which is designed for placing heavy barrels on top and moving them easily. The Truck is placed under the barrel when moving it to its desired location, and remains under the barrel until the contents are emptied.

E. C. STEARNS & Co., Syracuse, N. Y., sold their entire stock of Stove Repairs and Patterns on February 23, together with the good will of the business, to Nieffer Bros. of that city. The latter refer to this addition of their already large stock as further centering their business, and as enabling their customers to obtain their repairs from one source.

IN THEIR ADVERTISEMENT, occupying a page in this issue, Brittan, Graham & Mathes, Pittsburgh, Pa., call prominent attention to their Burglar Proof Door Locks, which have now been on the market for over five years. These Locks are referred to as cheap, of simple construction, effective and non-pickable, the necessity for key guards or contrivances for covering the keyhole being also obviated by their use.

IN OUR ISSUE of February 18 mention was made of Nail sample cases furnished by the Salem Wire Nail Company to their Chicago and New York houses. We have since learned that the St. Louis office of this concern were also supplied the same as the New York and Chicago offices. John H. Heinbucher, sales agent, in charge of the St. Louis office, invites the trade to come and look over the sample case, which is one of the most convenient cases we have ever seen. Samples are shown of every variety of Nails manufactured by the company, and the buyer has the opportunity of inspecting their entire line at a glance.

COL. ALBERT A. POPE, president of the Pope Mfg. Company, Boston, Mass., offers $10,000 worth of bicycles as prizes for the boys and young men who write the best essays on any phase of the subject of "Good Roads." Colonel Pope is an enthusiast on the subject of good roads, and believes that no element of civilization is of so vital importance as the unobstructed interchange of commodities. The fact is pointed out that the farmer must have a suitable road on which to take his produce to market, and the merchant's business depends upon the receipt of that produce. Colonel Pope founded the department of Road Construction in the Massachusetts Institute of Technology, and now makes the above offer.

THE SPENCER GUN PLANT has been removed from Windsor, Conn., to Brooklyn, N. Y., where a fine brick armory building has been erected on Bergen street, near Utica Ave. Hermann Boker & Co., 101 Duane street, New York, are the exclusive agents, and advise us that the supply was exhaused last year long before the demand was filled. About 5000 Spencer Repeating Shotguns are now in the hands of sportsmen, from which enthusiastic reports are received. The gun that will be placed on sale this year will be 12 gauge, grade C, having fine Damascus barrel, foreign walnut stock, chekered pistol-grip, rubber butt plate and case hardened system. There will also be an A and B grade, having still finer barrels and stocks, with handsomer engraving.

E. C. STEARNS & Co., Syracuse, N. Y., in calling attention to their Stearns' Lawn Mower advise us that they are desirous of getting one Hardware dealer in each city to act as exclusive agent for their machine, to the quality of which they call attention. They allude especially to the ease of operation, absence of noise and friction, precision in cutting, thorough construction and attractiveness of design and finish as qualities of their machine. Those in the trade who desire an agency as above may find it to their advantage to address the manufacturers.

Hardware Organization in New York.

THE HARDWARE TRADE of New York are considering the matter of a permanent organization of some kind with a view to meeting a want which has for years been felt in connection with the city's interest in Hardware and related lines. The opinion is very freely expressed that steps in this direction should be taken at once with a view to forming an organization which would unite manufacturers for the promotion of their common interests, and at the same time bring them together in a social way. This is certainly an opportune time for the trade to act in this direction, and it is to be hoped that there will be no unnecessary delay in moving in the matter.

As natural under the circumstances, there is some diversity of view as to the form which such an organization should assume. On one point, however, there is entire unanimity of opinion, and that is as to the desirability of having an annual dinner, which shall represent the trade centering in the city.

With reference to the formation of a trade organization, there are two projects which have been suggested. One is the organization of an association of merchants and manufacturers, which with suitable rooms might be made to serve the general interests of the trade and give a suitable place for meeting of manufacturers and others, while at the same time acquaintance and the spirit of fraternity might be directly cultivated by dinners or other social gatherings held as frequently as might be found desirable. It is obvious that such an organization would serve a useful purpose. The point is made by those who advocate it that the formation and carrying out of such an organization is a comparatively simple matter.

The project of having a Hardware club is regarded with much favor. Such a club would naturally have a resident and a non-resident membership, and be composed of merchants and manufacturers connected with the trade centering in the city, and with suitable rooms in a convenient and central location, a good restaurant, and a library provided with trade and other journals, and a collection of catalogues, price lists, &c., as complete as possible. Such a club would unquestionably be very desirable as the center of the Hardware interests of the city.

It is evident that there is something to be said in favor of these different plans, and it is for the trade to consider carefully the matter, and take such action as will be on the whole most advisable. At this time we would only emphasize the importance of acting promptly while the subject is prominently in the minds of the trade. It is scarcely necessary to say that the co-operation of *The Iron Age* will be given very heartily in favor of any movement in this direction which may be undertaken by the trade. The advantages which would result from such an organization would not be limited to the city or its vicinity, but would be experienced to a greater or less extent throughout the country at large.

We are advised that at an early date the trade will be called together to consider this matter. We bespeak their attendance, and their best attention to a matter so closely connected with the interests of the trade.

The Old Hardware Flag.

IN OUR LAST ISSUE, in connection with the illustration of the old Hardware flag a reference to the house in whose safe keeping the flag has been for nearly a generation, and to whose courtesy we are indebted in the matter of illustration, was inadvertently omitted. It will be remembered that at the 1860 dinner John W. Quincy presided, and since that date the flag has been taken care of by his house, John W. Quincy & Co., 98 William street, New York. The trade are thus indebted to them for the preservation of this interesting relic of old times, as well as for its pictorial representation in our columns. Some in the trade have a vague recollection of seeing it floating to the breeze above the St. Nicholas Hotel on the day of the 1860 dinner.

Price-Lists, Circulars, &c.

F. E. KOHLER & CO., successors to the Chieftain Company, Canton, Ohio: Hardware specialties. Attention is directed to their Post Hole Diggers, with their variety—Little Giant, Hercules, New Champion and Scheidler. Also to their Saw Sets, Vegetable Masher, Can Openers and Curry Combs.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Circular No. 210; Fishing Tackle, Lawn Tennis and Summer Sports. The 80 pages of this circular are filled with illustrations of these goods, accompanied by descriptions and prices. In Fishing Tackle their line is greatly enlarged, and additional attention has been given to Lawn Tennis. Particular emphasis is placed upon the desirability of their Oriental Racket.

KNAPP & COWLES MFG. COMPANY, Bridgeport, Conn.: Hardware and House-Furnishing Goods. A new edition of their catalogue is sent under date of February 1, 1892, with the names of the officers of the re-organized company. Illustrations and prices are given of their large and varied line of goods, including Screw Drivers, Mincing Knives, &c.

FULTON IRON AND ENGINE WORKS, Detroit, Mich., send an imitation of a large peanut, inclosed in which is a paper calling attention to their Sure Grip Steel Tackle Blocks. This mode of advertising comes in a neat paper box, and is unique enough to make a lasting impression.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

As the spring season advances there is more or less increase in the volume of business in various lines of Paints, but, like nearly all other merchandise that depends chiefly upon the home market for outlet, progress thus far has not only been rather slow, but somewhat disappointing. As far as can be learned, there is nothing in the condition of the market for base materials that would excite apprehension or tend to stimulate purchases. In fact, nothing bordering upon speculative influences is perceptible, and it is the exception that either jobbers or retailers go further than to keep supplies and assortments in proper shape. Competition in most departments continues keen. Manufacturers of mixed Leads and ready-mixed Paints contest corroders who are dilligently at work pushing Tinting Colors in connection with White Lead, and, besides this, there is internecine rivalry quite as sharp as the trade have ever been engaged in. From the West there are advices of rather higher prices for Linseed Oil and a further rise in cost of Spirits of Turpentine has taken place, but that addition to the cost of various goods into which the respective commodities enter has thus far had no effect aside from cutting down margins of profit.

White Lead.—Corroders note an increase in orders for their products for delivery during the next three months. Some of those orders involved 12-ton lots, which are put in at the minimum card rate, less regular discount for cash, but 5-ton orders appear to have been more numerous, and the surface indications are that jobbers still prefer to follow conservative line of action pending more satisfactory indications regarding the probable spring season consumption. At second hands the list prices for lots of 500 lb to 1 ton are still "cut" more or less, but not to a greater extent than heretofore. The few "outside" corroders located in this vicinity keep their prices very close to those quoted by the "combine" interest. Mixed Leads are moving out rather slowly at the moment, but in this class of pigment, as well as in corroders' product, business increases as the spring season advances.

Litharge and Red Lead.—The cheaper varieties of Litharge, used chiefly by glassmakers, are moving to about the usual extent for the season and at steady prices, but powdered is yet rather slow and faring hardly as well as the general line of house painters' goods. Red Lead, however, is moving more freely and to quite the average extent for the season. No changes in prices have taken place.

Zincs.—In some quarters there seems to be a feeling of disappointment at the run of new orders for American Oxide, but the output of most establishments is closely taken up through deliveries on old contracts, and accumulations of supply that take place are not heavy enough to exert a disturbing effect. The old line of prices is adhered to, at all events, and the canvass for new business is temperate. Foreign Zincs are without change in price, but find rather slow sale at the moment.

Colors.—Higher prices for Quicksilver have been established during the past few days and that fact has served to impart more tone to the market for Quicksilver Vermilion. Prices are no higher, however, and an advance is not looked for unless the base material undergoes a further sharp rise, since the cheaper brands of the "straight goods" and Artificial Vermilion are being pushed industriously at comparatively low prices. On other Dry Colors there is nothing to report apart from a fair average trade for the season, chiefly at steady prices. Oil colors are moving off fairly, but hardly as freely as usual at this season, and for standard goods prices remain quite steady.

Miscellaneous.—Chalk has undergone no change. Cargo lots for near future delivery are not offered, and for smaller quantities in bulk or in barrels former prices prevail. Whiting sells at the former line of prices, but to a merely fair extent. On Putty there is nothing new to note save that the cheaper varieties are more firmly held, owing, probably to the fact that cheap lots of Linseed Oil are now difficult to reach. No change of importance in the market for Clays.

Oils and Turpentine.

The chief features during the week under review have been a further rise in prices of Spirits Turpentine and some signs of hardening in values of Western brands of Linseed Oil. Outside of this there is nothing to note apart from the fact that business nearly all along the line has continued rather slow and the demand tame. On the part of home distributors there is no sign of tendency to purchase with greater freedom and exporters are remarkably shy, claiming that foreign markets are in unenviable shape. It is the fact, however, that scarcely any change has taken place in prices of Oils for which export outlet is an important factor, and that prices in nearly all other lines have held very steady.

Linseed Oil.—City crushers have made no change in their prices, but most firms report an improvement in sales and a turn for the better in the tone of the market. The better distribution doubtless helped to improve matters more or less, but more favorable reports from the West, along with higher cost of Seed, has undoubtedly shaped sentiment in a certain degree. Western brands of Oil are not openly offered now at less than 35¢ in carload lots, and it seems doubtful if a lower price would be accepted, since the cost of Seed has advanced considerably, while Oil is not only in better demand but offered reservedly.

Spirits Turpentine.—In this article there has been a further sharp advance. Sales were made at up to 42¢ @ 42½¢, and holders are now standing out for 1¢ more. Stocks at seaboard ports are much lighter now than they were a year ago, and the statistical position, in connection with the fact that prices have latterly been unnaturally low, is chiefly responsible for the advance.

Model Lawn Sweeper.

Thompson Mfg. Company, Elkhart, Ind., are offering their Model Lawn Sweeper in an improved form for the season of 1892, as shown in Fig. 1. The No. 1 sweeper

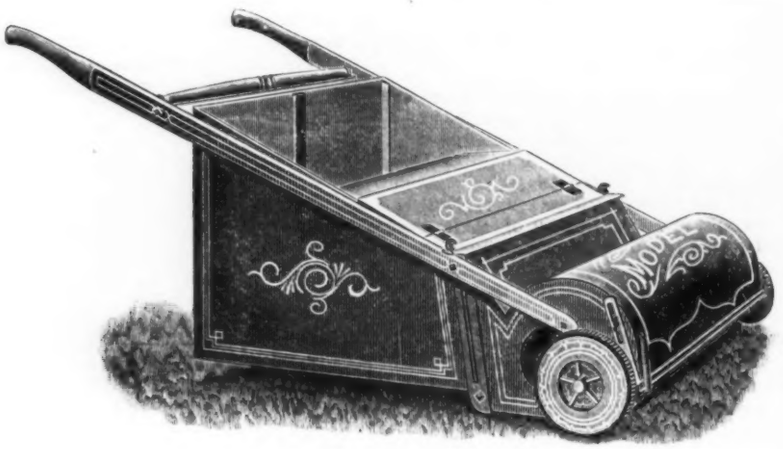


Fig. 1.—Model Lawn Sweeper.

is 25 inches wide over all, weighing 28 pounds, and carrying a 21 inch brush. The brush is fan shaped, and revolves rapidly in the same direction as the drive wheels, throwing the litter backward from its under surface. Immediately behind the brush, and parallel with it, a thin shoe passes along over the ground, with its upper surface inclined. This operation is referred to as involving the principle of dust pan and broom. In addition to this it is stated that the fan-shaped brush creates a strong current of air, which blows the litter back into the rear of the hopper. If sticks or stones are encountered, it is stated that the shoe does not allow them to pass under it, but provides a passage over it into the hopper. This eature of the machine, it is remarked, is peculiar to this sweeper. The manufacturers add that another valuable feature of the machine is that it works equally well over a smooth or rough surface, cut or uncut lawns. Provision is made for this by hanging the brush in an oscillating frame. The brush is pressed against the ground with a given tension by a yielding spring, by means of which the machine, it is stated, will pick up particles lying in the depressions on the lawn, thus gathering leaves in the spring or fall, or clearing the sod before cutting. When leaves deeply imbedded in tall grass have to be gathered, a special rake shoe is furnished, with fingers that run between the blades of grass to get the leaves.

The hopper or basket of the sweeper is hinged at the front end, as in Fig. 2, so it can be dumped, or it may be lifted out entirely and emptied into a cart or wheelbarrow.

It is stated that the hopper is so light that there is no preceptible weight on the arms of the operator, even when it is filled, and that the sweeper is so simple, light and easy running any lady or child can operate it. A No. 2 Lawn Sweeper is also made, suitable for use on large lawns, public parks, cemeteries and picnic grounds, 35 inches wide over all, with a 30 inch brush, and weighing 31 pounds. Double drive wheels are used on this machine; otherwise this and the No. 1 work the same.

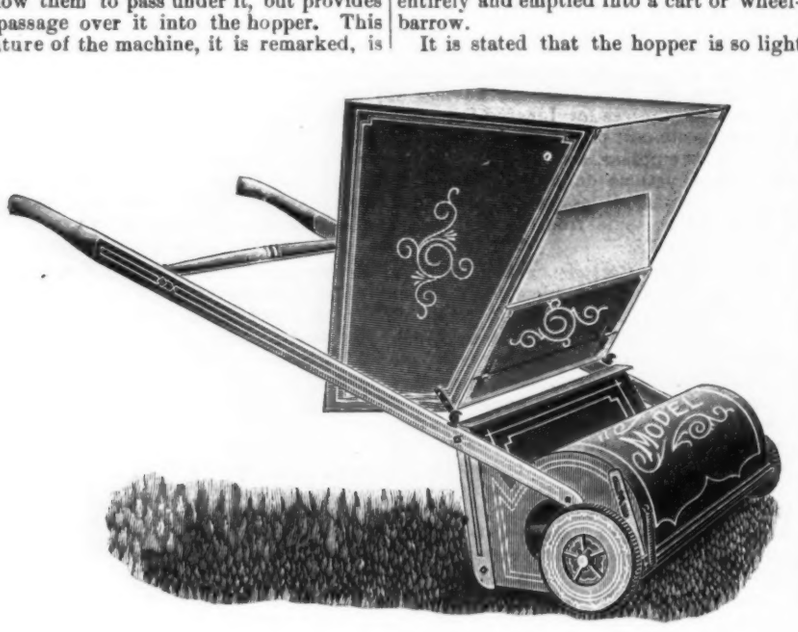


Fig. 2.—Showing the Manner of Dumping Hopper.

The point is made that the sweepers are built from seasoned lumber, well put together, well painted and finished, and that the castings are annealed, with all wearing parts interchangeable.

The manufacturers guarantee the machines to clean the lawn perfectly, leaving the surface free from litter and the sod in a healthy condition; also to take up pieces of paper, sticks, stones, &c., quickly and perfectly. The sweepers are painted or finished in natural oak, as desired.

The Shimer Post Spade.

J. M. Shimer is introducing through L. & R. Wister & Co., Philadelphia, Pa., exclusive wholesale agents, the post spade, as shown in the accompanying illustrations. As shown in Fig. 1, the spade is something over 5 feet long, having a hollow handle, to which the steel ends are solidly welded. One end is a solid steel spade, and the opposite end is a pick of the same material, so that they can be easily sharpened. The spade is referred to as being in every respect similar to the old-fashioned tool, except that the handle is hollow, and that it is 8 to 10 pounds lighter than the old style of spade, thereby enabling the handle to be made sufficiently large so that it does not cramp the hand in using it, besides permitting a quicker and more forcible stroke. Figs. 2 and 3 show the three parts of which the tool is composed.

Fig. 1.—The Shimer Post Spade.

Fig. 2.—Handle of Post Spade.

Fig. 3.—Pick and Spade Ends of Post Spade.

In view of the probable construction of an East River tunnel, an incorporation was effected at Albany, under the title of Long Island and New York Terminal Railroad Company, with a capital of $1,000,000, to construct and operate a line of railroads through that tunnel. The route selected is from Laurel Hill, L. I., to Park avenue, near Forty-second street, New York City. Austin Corbin heads the list of directors.

The Pacific Mail Company's new steamship Columbia was launched from Roach's yard at Chester, Pa., on Saturday. She is the first boat built under the United States standard rules, and enters the third class. Her molded length is 326 feet, and she is 346 feet over all. Her beam is 45 feet; and her depth of hold, 27 feet 6 inches. There will be six steel boilers, each 12 feet in diameter by 11 feet 7 inches in length, with a working pressure of 100 pounds; and she is expected to develop a speed of 15 knots an hour. She will have two steel masts, schooner-rigged, and will be supplied with six metallic lifeboats.

The Russell Jennings Mfg. Company's Box for Bits.

The Russell Jennings Mfg. Company, Deep River, Conn., are using a box, as shown in Figs 1, 2 and 3, in which to pack their bits in sets. Fig. 1 shows the box closed. It contains three sections, and each section fastens itself when closed.

Fig. 1.—The Russell Jennings Mfg. Co.'s Box for Bits.

The bits rest in grooves of suitable size for each particular bit, and these grooves are so cut that when the bits lie therein their upper surfaces are in a plane, and when the sections or lids are closed the bits are held in position. Fig. 2 shows the box with lid open, and the upper section containing $\frac{4}{16}$, $\frac{5}{16}$, $\frac{6}{16}$, $\frac{7}{16}$, $\frac{8}{16}$, $\frac{9}{16}$. This is the way the boxes would look in a show

Fig. 2.—Bit Box with Lid Open.

case or window. Fig. 3 shows the box opened at the second section and containing $\frac{10}{16}$, $\frac{11}{16}$, $\frac{12}{16}$, $\frac{13}{16}$, while the lower section contains $\frac{14}{16}$, $\frac{15}{16}$, $\frac{16}{16}$. The boxes are made of hard wood, and are referred to as being strong, durable and ornamental in appearance. Tne point is made that they are convenient as to size and shape, easy to handle, and the bits are always in place so that the carpenter will know just where

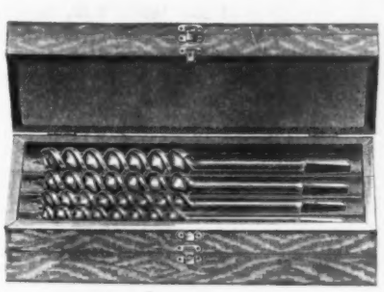


Fig. 3.—Bit Box Open at the Second Section.

to find the size of bit he wishes to use. The manufacturers state that this box, patented by S. H. Jennings, president and treasurer of the company, will be used exclusively for their goods. They have heretofore packed their sets in paper boxes, but no extra charge will be made for this patent box.

Advices from Nicaragua state that a new tariff has been arranged to go into effect on April 19. The rates are not yet published, but it is stated that they are much higher than the present duties, and have been so arranged to allow a basis on which a reciprocal treaty can be negotiated with the United States.

Cactus Lawn Sprinkler.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering this article, as illustrated in Fig. 1. The form of spray thrown by the sprinkler is illustrated in

Fig. 1.—Cactus Lawn Sprinkler.

Fig. 2, and conveys an idea of the surface covered by the sprinkler in any given position on the lawn. It will be seen that the sprinkler has a central spray, which adds largely to its beauty when working. Another feature, to which especial attention is directed, is the absence of revolving parts, which not only reduces the cost of the sprinkler, but renders it practically indestructible. The flanging base allows the sprinkler to be drawn from one part of the lawn by the hose without turning off the water, and without necessarily wetting feet or garments. The sprinkler is made for both $\frac{3}{4}$ and 1 inch hose, and packed one in a paper box, one dozen in a wood case.

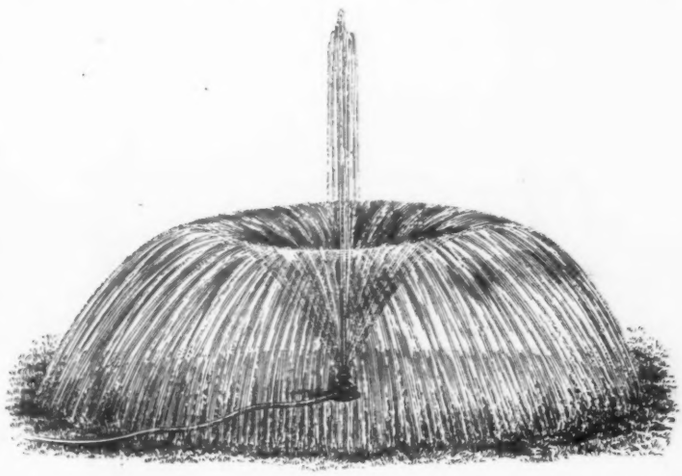


Fig. 2.—Spray thrown by Cactus Lawn Sprinkler.

Congress Hat Hook.

Auburn Novelty Company, Auburn, Maine, are offering a combined hat and coat hook, so arranged as not to allow a hat to be blown off by the wind or be knocked off by being hit. The hook is designed so that one projection goes inside the hat and another projection over the rim. The hook is also made in combination with a parcel rack for use in passenger coaches, as it is stated that there is no possible chance for a hat to be removed by the shaking or jarring of the cars when in motion.

A dispatch from Costa Rica, of the 29th ult., represents the financial situation as so unsatisfactory that the Government have suspended their efforts to secure loans. The coffee crop is reported as only two-thirds as much as that of last year.

The Confort Hand Attachment for Sewing Machines.

Confort Attachment Company, 44 Barclay street, New York, are introducing the above article, as illustrated in Fig. 1.

Fig. 1.—The Confort Hand Attachment for Sewing Machines.

The metal part of the device which attaches to the treadle has a nickel-plated handle socket and a brass plate. The wood handle is finished in natural wood and is $2\frac{1}{2}$ feet long. It is designed to operate any sewing machine by hand, Fig. 2, being securely attached at any desired point on the treadle. The upper end of the lever being free to be moved into any position, the hand and arm of

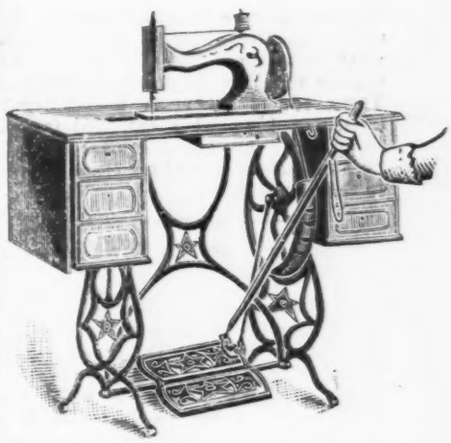


Fig. 2.—Application of Confort Hand Attachment.

the operator are not constrained, and the device may be used exclusively, or temporarily as rest from foot power. When operating the machine by foot power the handle can be unscrewed from the socket, leaving the balance of the attachment on

the treadle. The Confort is particularly recommended for use by those whose physical condition is such as to forbid them running a machine by foot power.

Champion Pulley Extension Ladder.

The Udell Woodenware Works, A. A. Barnes, proprietor, North Indianapolis, Ind., are introducing the new pulley extension ladder, illustrated herewith; and

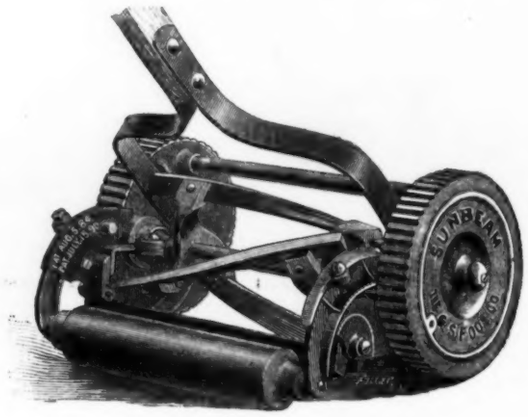
Champion Pulley Extension Ladder.

refer to it as being constructed of Norway pine in two sections, so arranged as to readily enable one person to raise a ladder 50 or 60 feet in length. The catches, one of which is here shown, are of malleable iron

and the bars are of wrought iron. The malleable catches are so arranged that when the upper section of ladder is raised slightly they drop into position instantly. These ladders are made in six regular sizes, measuring when extended from 24 to 50 feet. The manufacturers state that nothing but the best of materials are used in their construction.

Sunbeam Noiseless Lawn Mower.

G. S. Foos Company, Springfield, Ohio, are offering the Noiseless lawn mower, as illustrated herewith. The construction of the machine is described as follows: The clutch gear for operating the reel consists of three pieces, the pawls of which are made of malleable iron, having positively no wearing points, and by reason of their construction are entirely noiseless in their operation. The driving mechanism consists of two 8-inch drive wheels, into which teeth are cast, made extra heavy to prevent breakages. The cutting bar is so pivoted that the extreme cutting edge only of the cutter bar knife is presented to the grass, and by means of a screw driver the wear on the reel knives may be taken up, and the machine adjusted in a short time. A bracket semicircular in form, held in place by a single set screw, holds the roller. The screw can be quickly loosened and the machine adjusted to cut grass from ½ to 1½ inches in length. The connecting bar in front is a single piece of ⅝ inch cold rolled steel, the ends of which are tenoned and project through the side plates, being held in place by nuts and steel pins. Particular attention is called to the removable reel-shaft caps, by removing which and taking off the drive wheels, the reel, it is stated, may be readily removed for sharpening or for repairing the machine. The manufacturers state that all material used in the construction of these machines is of the best quality obtainable, the cutting knives all being made of tool steel. The entire machine is referred to as symmetrical in appearance and handsomely finished, the body of the mower being painted in red, striped in green and gold. The wheels are green, striped in gold, while the handle braces are finished in black japan, also striped.



Sunbeam Noiseless Lawn Mower.

Anti Friction Latch Bolt.

Sargent & Co., 37 Chambers street, New York, and New Haven, Conn., are introducing an anti-friction latch bolt, as shown in Figs. 1 and 2, in which a screen-door catch and knob are illustrated. The special feature of the catch is in the peculiar formation of the latch bolt, together with its strike plate or nosing, which has the effect of overcoming friction, thus enabling the catch to act quickly and to close with remarkable ease. The actuating spring is strong, though an easy one, and allows the spring hinges to close the door, even if not opened more than 1 inch. With the stop the knob may be locked so the door cannot be opened from the out-

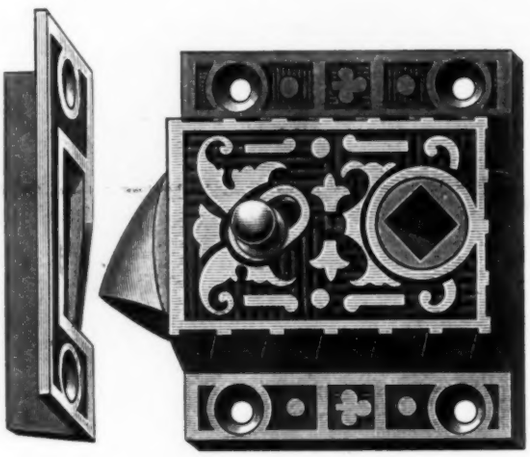


Fig. 1.—Anti-Friction Latch Bolt.

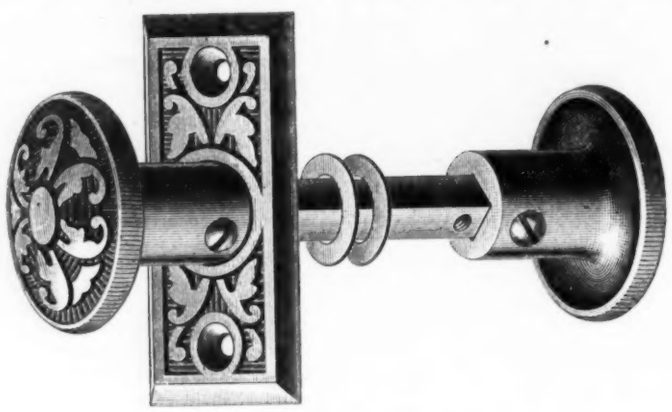


Fig. 2.—Knob for Latch Bolt.

side. Screen-door catches with anti-friction latch bolts are made in various forms and finishes; and the anti-friction latch bolt is also used in a line of cupboard turns.

Stanley's Butt and Rabbet Gauges.

A tool in which mechanics generally cannot fail to find interest is that just brought out by the Stanley Rule and Level Company, with factories at New Britain, Conn., and New York warerooms at 29 Chambers street. This tool is of special service in hanging doors, mortising, marking, &c., and is shown in general view in the accompanying illustrations. This gauge has two bars made of brass, one being movable within the other. There are also provided three blades or markers. The two steel points at the extreme end of the inner bar are so arranged that they may be moved to any position by means of the thumb screw at the opposite end of the tool. Fig. 1 represents the tool when used as a rabbet gauge, the thumb screw referred to being indicated at the extreme right of the engraving. The rosewood head on the outer bar adapts the tool for use as an ordinary marking or slitting gauge. At one end of the outer bar is attached a steel plate or stop, which, in connection with the rosewood head, set at the proper distance from the plate, produces a double head for mortising. When the head and plate have been adjusted to the desired width for the mortise, both markers can still be moved by means of the thumb screws and the mortise lines set further in from the edge of the work or brought out nearer to the edge without disturbing the width of the mortise. Fig. 2 of the illustrations represents the tool as it appears when used as a butt gauge for hanging doors. This arrangement of parts is produced by bringing the marker on the upper side of the bar back of and to any required distance from the outer surface of the steel plate. This outer surface is placed against the back of the rabbet in the door casing, then the owner can gauge correctly for back leaf of the butt, and without changing any of the parts the inner surface of the steel plate acts as a guide for the other marker in gauging on the edge of the door for the front leaf of the butt. The manufacturers state that the rosewood head should be secured at the end of the bar nearest the thumb screw when the tool is being used as a butt gauge. The exact thickness of the butt is ascertained by placing one edge of it between the surface of the rosewood head and the small blade which stands up back of it. Reference is also made to the fact that the movable steel plate affords a perfect guide for gauging in or near rabbets of all kinds.

Stanley's Butt and Rabbet Gauge.—Fig. 1.—Tool when Used as a Rabbet Gauge.

Fig. 2.—When Used as a Butt Gauge.

The Empire Double Dauber.

Empire Portable Forge Company, Lansingburg, N. Y., are introducing this article, as illustrated herewith. It is a dauber and mud brush combined in one, with a mud scraper. The bristles are referred to as being inserted in a solid knot, and keyed in, with the face cut in the best form to fit the blacking box, and the handle as well tinned. It is stated that with this brush there is no necessity of another brush to clean off the mud; that the knot of bristles will not mat down or spread, and that it does not require to be wound with cord. The daubers are packed in paper boxes of one dozen each.

The Empire Double Dauber.

The contract between the Government of Salvador and the Pacific Mail Steamship Company has been renewed on special terms, by which the company agree to give a regular service to the ports of Salvador, with one or two steamers extra during harvest—January to June—should they be needed.

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CURRENT HARDWARE PRICES.

MARCH 2, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&5%
North's .....list net @10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.—
Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11@11½¢
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe b'and.11@11½¢
Arenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Chenev Anvil and Vise.....25%
Allen Anvil and Vise, $8.00.....40&10%
Star.....45&5%

Apple Parers—See Parers. Apple, &c

Augers and Bits—
Douglass Mfg. Co.....
Wm. A. Ives & Co.....
Humphreysville Mfg. Co.....
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.....
Rockford Bit Company.....
} 70&10@70 & 10&5%
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip 60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip 40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&10%
Pugh's Black.....30%
Pugh's Jenning's Pattern.....40%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits.....50&10%

Bit Stock Drills—
Morse Twist Drills .....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz $60.....40%
Swan's 40%
Steer's, No. 1, $36; No. 2, $32.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common .....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.10.....25&10%
Bee.....35@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co ...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass' .....40&10%
Double Cut, Ives' .....60@60&10%

Hollow Augers—
Ives .....
French, Swift & Co.....
Douglass' .....
} 33⅓@ 33⅓&10%
Bonney's Adjustable, ₩ doz $48...40&10%
Stearns' .....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's .....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's .....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common . ₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad...₩ gr. $1.30@1 40
Awls, Handled Brad...₩ gr.$2.50@$3.00
Awls, Handled Scratch..₩ gr.$4.00@4.50
Awls, Socket Scratch..₩ doz, $1.10@1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—
No. 1...3½¢@4½¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½% } 3 % cash
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....6½¢@7¢
National Tubular Self-Oiling.....33⅓@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances	No. 2000	20	30
Chatillon, ₩ dos	$0.80	0.95	1.75 net

Spring Balances.....40%
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—
Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)... ₩ doz $2.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.)....₩ gro $16.50
Spiral.....₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co .....₩ doz $5.50
Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20 %

Bells—
Cow—
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Door—
Gong, Abbe's .....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connett's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned .....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Electric,
Wollensak's.....30%
Bigelow & Dowse.....30%
Taylor's 20%
Hand—
Light Brass.....70&10%
Extra Heavy.....70
White 70%
Silver Chime.....33⅓&10%
Globe Cone's Patent) .....25&10@35%
Miscellaneous—
Call.....40@40&5%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—
Blacksmiths'..... 60&10@60&10&5%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—
Common Standard.....70@70&10&5%
Standard.....70@70&5%
Extra.....60@60&10%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—
Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889... See Trade Report
Cleveland Block Co., Mal. iron.....50%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Boards, Stove.
Wood Lined Crystal.....50%
Oxidized.....45%
Embossed.....50%
Paper Lined Zinc.....55%
Crystal.....55%
Embossed.....55%
New Tacoma.....55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, Norway, list Oct., '84... 80@80&10%
Phila. pattern, list Oct. 7,'84..75@75&10%
R.B.&W., old list 70%
Machine, list Jan. 1, 1890..... 80@80&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%
Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts 60&10@60&10&5%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush. Com'n " ....55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.
Common and Ring.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔.....2½¢

Braces.—
American Bit Brace Co.:
Nos. 10. 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 15, 26, 26, 37.....70&10&5%
Ball Braces, net .....$1.12 to $1.25#
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.1
Barber's,
Nos. 10 to 16.....50@50&10%
Nos. 30 to 33.....50@50&10%
Nos. 40 to 63.....50&10@50&10&5%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.75
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 31 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....50&5%
Spofford.....50&5@50&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—
Shelf, plain.
Regular list.....65@70%
Sargent's list.....66⅔@66⅔&10%
Shelf, fancy.
Sargent's list.....66⅔@66⅔&10%
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting.	Inch	9	10	9x11
	Per doz	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co .....65&10%
Morgan Odorless.....₩ doz $12, 33⅓%

Buckets, Well.
Galvanized—
Hill's.....₩ dos, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ dos. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass.....80@80&10%
Cast Brass, Tiebout's'.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%
Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} ..70&10 @ 75%
Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c ....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47@50¢
Musket Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
A. B. Genuine Imported.....45¢
Eley's E. B.....56¢ @ 58¢
Eley's D Waterproof, Central Fire...$1.00
Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Cards—List January 23, 1891.
Watson's Cotton, Wool, Horse and File.....25%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—
Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....3 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Casters—
Bed.....
Plate.....
Shallow Socket.....
} Brass....55&55&10%
} Others...60@60&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....70%
Payson's Truck.....60%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic.....5 ℔ palls ₩ ℔ 5¢

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890.....60@ 60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.45	4.45	3.80	3.65	3.50	3.40	3.25

Less than cask lots, add ½¢@1¢ ₩ ℔.
German Coil, list Oct. 6, 1890...60@60&5%
German Halter Chain, list Oct. 6, 1890 60@60&5%
Covert Halter.....60&2%
Covert Traces.....35@3%
Covert Heel Chain .....50&3%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 5½¢@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—
White, case lots, ₩ gr 50¢; small lots 55 @56¢
Red, case lots...₩ gr 67¢; small lots 77 @78¢
Blue, case lots...₩ gr 75¢; small lots 85¢ See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
..75 @ 75&10 %
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16%

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$3.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.
Tiffin Union, each, 5 gal. $3.25; 7 gal. $3.75; 10 gal..$4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75 15 gal. $3.00 20 gal., 3 75

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60@60&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.
Butchers'.
Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Loboff & Co.....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2d grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....60%&5&70%
Norway Spring Bar Clips, 5-16..20&5&5%
Wrought-Iron Felloe Clips.....₩ ℔, 5½¢
Steel Felloe Clips.....₩ ℔, 5¢
Baker Axle Clips.....15%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&25

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.
Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.
Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
American Curry Comb Co.....Net prices

Compasses, Dividers, &c.—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—
Sash.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 12 @ 12¢
White Cotton Braided, fair. ₩ ℔, 24¢@25¢
Common Russia Sash.....₩ ℔, 12½@13¢
Patent Russia Sash.....₩ ℔, 14¢
Cable Laid Italian Sash.....₩ ℔, 21@22¢
India Cable Laid Sash.....₩ ℔, 12¢
Silver Lace—
A Quality, White, 50¢.....35 %
A Quality, Drab, 55¢.....35 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring, Extra Braided White,34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....80¢
Egyptian, India Hemp, Braided.....26¢
Massachusetts, White.....26¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢..30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White. ₩ ℔, 28¢,10%
Wire Picture.
Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50&5&30&50&10&25

Crayons.
White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain

Cutters—
Meat.
Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's ₩ doz.....40&5%

Nos.		100	150
		$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$35	$50

Nos.	10	12	22	32	42
Each	$2	$2.50	$4	$6	$15

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$2	$2.50	$4	$6	$15

Great American Meat Cutter.....30%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$2.50	$4.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. ..... ₩ doz $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$90	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00
Tobacco.
Champion.....20&10@30%
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $13.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%
Washer.
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's. ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—
Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz.17.50
Kohler' New Champion.....₩ doz. $9.00
Schnieder.....₩ doz. $13.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&25&50&10%
Gibbs Post Hole Digger.....₩ doz $15.00
Imperial.....₩ doz $7.50
Shimer's Hollow Handle, ₩ doz, $24..40%

Dividers—
See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.
Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,30%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 35%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll s.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..35@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....30&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Cleveland.....50&10&5%
Diamond, W. & B.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%
Morse.....50&10&5%
New Process.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%

Drill Bits or Bit Stock Drills—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.
Douglas Mfg. Co.....30@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles.....65&10%
No. 56.....70&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70%
Knapp & Cowles:
No. 1.....60&20&70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50& 5@50&10&5%
Stearns'.....35&10&25%
Gay & Parsons.....35%
Champion.....35&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..35@35&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $8.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ ℔.....4½¢	5 ¢	2½¢
½ kegs, ₩ ℔...4½¢	5½¢	2½¢
¼ kegs, ₩ ℔...5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case.....6 ¢	6½¢	5 ¢
10-℔ cans, less than 10.....10 ¢	10 ¢	

Enameled and Tinned Ware See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00
Zimmerman's.....45 %

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&3%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@
60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $36.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—
Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....60&10@60&10&5%
Arcade.....60&10@60&10&10%
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chesea Horse Rasps, Hand Cut...50&10%
Arcade Horse Rasps.....60&10%
Imported—
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%

Fixtures.
Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—
Hay, Manure, &c., Asso List. 65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—
Saw—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%
Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons.. 33⅓@ 33⅓&10%
Stearns' Frames and Corners..35@35&10%
Cortland.....40@40&5%

Freezers, Ice Cream—
White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....60%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....50%
Zero.....60&10&10%
Boss and Pet.....60&10&10&10%
Keystone, P. D. & Co., each $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.
Gersdorff's Perfection, Standard and Globe; Tin, 1 gro., 10 %; 2 to 5 gro., 20 %; 6 to 10 gro.....30 %
Copper, 1 to 6 doz., 15 %; 6 to 12 doz., 20 %; over 12 doz.....25 %

Furnaces, Soldering.
Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. Gem, copper reservoir, 8.50

Fuse—Dis. 12½%. ₩ 1000 ft
Common Hemp Fuse, for dry ground $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.35
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....50@50&5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.
Marking, Mortise, &c.....50&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....20&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee." ₩ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%
Dodd's Liquid Glue.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.
Fraser's.....Keg ₩ ℔ 4¢, Pail ₩ ℔ 5¢
Fraser's, in boxes.....₩ gr $2.50
Dixon's Everlasting, in bxs...₩ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—
Small, at factory.....₩ ton $7.50@8.00
Family, regular list.....60%
Family, Cleveland Stone Co.....30 %

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts, Awl.
Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00.45&10%

Halters.
Covert's, Rope, Jute.....60&10&10&2%
Covert's, Rope, 7-16-in., Jute.....70&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie. 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....35&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Verree. } 50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting.50&5%
Hartford, Nail Hammers.....40&2%
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.35, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@5%
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
2 ℔ and under.....₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₩ ℔ 30¢ }
Wilkinson's Smiths.....10½@11¢₩ ℔

Handcuffs and Leg Irons—See Police Goods,

Handles—
Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 23¢; No. 2 15¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Champion.....18¢
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.10	1.35	1.50

60&10&
Joggin's Latches.....₩ doz 30¢@3
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62 ½. Plate, $1.10 ; no Plate, $0.85.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%
Wood—
Saw and Plane.....40&10@40&10&5
Hammer, Hatchet, Axe, &c....40@40&5%
Grad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd..₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd...₩ gr 3.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
I. B. Smith & Co.'s Pat File.....60
File, assorted..... ₩ gr 2 75
Auger, assorted.....₩ gr 5.00
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.25
Pat. Auger, Swan's.....₩ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Kedina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track.....55%
Shed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....60@5%
Wood Track Iron Clad, ₩ ft. 10¢.....50
&15&60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00.....20%
Eclipse.....30&10%
Felix, ₩ set $4.50.....30%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Lane's Parlor.....40%
Ball Bearing Door Hanger..90&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 63¾; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....50@50&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%
Pendulum, Payson's.....40%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
} 40 & 10 @ 50&5 %
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50.....75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's Nos. 1, 3, 5, 11, 13.....75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10@2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₩ dos $4.40, 60%
N. E.....₩ dos $7.00, 55%
H. B. Reversible.....₩ dos $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ dos $5.00, 55&10%
Automatic.....₩ dos $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March 1886.....₩ %
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent.....40%
Acme.....30%
U. S.....25&10%
Empire and Crown.....30%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Stearn's.....50&10%
Samson, ₩ gross.....$14.00
} Extra 5@10 % often given.

Wrought Iron Hinges.

List February 14, 1891.
Strap and T.....50&10%
Corrugated Strap & T.....50@50&10%
Screw Hook and Strap.....{ 6 to 12 in., ₩ lb. 4¢ / 14 to 20 in., ₩ lb.3½¢ / 22 to 36 in., ₩ lb. 3¢
Screw Hook and Eye.....{ ½ in., ₩ lb 7¾¢ / ⅝ in., ₩ lb 5¾¢ / ¾ in., ₩ lb 4¾¢
Rolled Blind Hinges, Nos. 33 and 34.....50&10%
Rolled Blind Hinges, Nos. 332 and 334.....55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₩ lb.....5¢ / over 12 in., ₩ lb.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. } 70@70&5%
Am. Axe and Tool Co., S. & O. Pat.....60&5@60&10%
Chattanooga Tool Co., S. & O. Pat..60&5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton &c.....70%
Warren Hoe.....60%
Magic.....₩ dos $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ dos $18.....60%

Bit.

Extension,
Barber's, ₩ dos $15.00.....40@40&10%
Ives, ₩ dos $20.00.....60&5@60&10%
Diagonal.....₩ dos $24.00, 40%
Angular.....₩ dos $24.00, 40&5%

File and Tool—

Bals Pat.....₩ dos $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.
} 60&10&10%
60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list.
55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₩ dos $1.35
Cotton Pat. (N.Y. Mallet & Handle W'ks).
20%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c.
See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10%
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....30@30&10%
Atlas, Coat and Hat.....60@60&10%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ dos $2.25
Bush.....50@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron.
70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper.....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 lb, $3.30@$3.40
Self-Heating.....₩ dos $9.00 net
Self-Heating, Tailors'....₩ dos $18.00 net
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron.....50&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₩ lb.....3 @3½¢
Combined Fluter and Sad Iron, ₩ dos, $15.00.....15%
Fox Reversible, Self-Fluter ₩ dos $34.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....9¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....₩ lb 19 @ 21¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per dos., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....40%
Victor.....40%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld. W.M.list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ dos $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....35%
Ames' Butcher Knives.....35%
Foster Bros.' Butcher, &c.....40%
Jordan's A.A.A., Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....30%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat..
$2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50
Corn—
Bradley's.....10%
Wadsworth's.....35%

Drawing—

Witherby.....
P. S. & W.....
Mix.....
New Haven.....
} .75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$3.60 @ $9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₩ dos $11.00@$11.50
Heath's.....₩ dos $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₩ dos.$7.00 @ $8.00

Mincing—

Am. (3d quality) ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....30&10%
Smith's, ₩ dos, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₩ dos $3.00 .25%
Buffalo Double Adj'table.₩ dos $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hematite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1886...40%
Furniture, Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₩ dos $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ dos.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards.....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular.....
₩ dos $3.50
3-inch Bull's-eye Police regular.....
₩ dos $3.90
2¾-inch Bull's-eye Police flash light.....
₩ dos $4.00
3-inch Bull's-eye Police flash light.....
₩ dos $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....50%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....5%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½ $2.50,
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 18 } 19 } 20 100 ft. $3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ dos $7.50, 25%

Links, Open.

Terry's—per gro.:

Nos.....	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85...33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....35&2%
"Champion" Cab. and Combin...33⅓&2%
Yale.....net prices
Romer's.....35%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889.....65&10@70%
Mallory, Wheeler & Co., list July, '88.....Much lower net prices often made.
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88,
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&10&2%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delts Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....35%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 506.....15%
A. E. Delts.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ dos, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....35%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....60%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 1010 line.....55&5%
No. 41 line.....45&10%
No. 81 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr..33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886...70%
Payson's Perfect.....60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....35&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Lieseche's, No. 100, ₩ gr $3; 105, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%
Giant, list Jan., 1892.....70&5%

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ dos, $1.75; ₩ gross.....$17 00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	.50%
Snell's, Rice's Pat.	5.50	6.75	.40&10&10%
Jennings	5.50	6.75	.45&45&10%
Other Machines	5.25	6.75	
Phillips' Patent with Augers	7.00	7.50	
Miller's Falls	7.50		.35%

Fluting.

Knox, 4½-inch Rolls.....$3.25 each }
Knox, 6-inch Rolls.....$3.60 each } 35%
Eagle, 3¼-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $5.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel 6 in.....$5.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₩ dos $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₩ dos 15 20.....40%
Shepard Hand Fluter, No. 110 ₩ dos $11.00.....40%
Shepard Hand Fluter, No. 95 ₩ dos $8.00.....40%
Clark's Hand Fluter, ₩ dos $15.00.....35%
Combined Fluter and Sad Iron, ₩ dos $15.00.....30%
Buffalo ₩ dos $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.....30%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's.....35%
Sure Grip Steel Tackle Blocks.....35%

Washing—

Anthony Wayne, ₩ dos No. 1, $51 No. 2, $45; No. 3, $42.
Western Star ₩ dos No. 2, $45 No. 3 $48,

Mallets.
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 20@20&10%

Hatchets. Regular list. 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₩ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz.....$2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888. 60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg Co. 20&10@30%
The Swift, Lane Bros.....30&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
Pennsylvania. New Model, Excelsior, Continental, &c.....60@60&5%
.....60&10%
Philadelphia.....60&10&10%
Perfection.....60&10@60&10&5%
Easy.....60&10@60&10&5%
Bay State.....60&10&5@70%
Other Machines.....60&10&5@70%

Muzzles—
Safety.....₩ doz, $3.00, 25 %

Nails.
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75&10@80%
Tack Mfrs.' list.....70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base.....$1.95 @ $2.00

Horse—

Nos.	6	7	8	9	10	
Ausable....	28¢	26¢	25¢	24¢	23¢,	40&5&2½%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢,	80%
Essex.....	28¢	26¢	25¢	24¢	23¢,	40&5&2½%
Lyra.....	19¢	17¢	16¢	15¢	14¢,	80 %
Snowden	19¢	17¢	16¢	15¢	14¢,	80 %
Putnam.....	23¢	21¢	20¢	19¢	18¢,	1000 ℔ in year 15%
Vulcan.....	23¢	21¢	20¢	19¢	18¢	12½&10%
Northwest'n.	25¢	23¢	22¢	21¢	20¢,	35@25&5%
Globe.....	23¢	21¢	20¢	19¢	18¢,	20&5&5%
Boston.....	23¢	21¢	20¢	19¢	18¢,	20&5&5%
A. C.....	25¢	23¢	22¢	21¢	21¢,	25&10@33½&5%
C. B.-K.....	25¢	23¢	22¢	21¢	21¢,	25&10@33½&5%
Maud S.....	25¢	23¢	22¢	21¢	21¢,	40&10 %
Champlain ..	28¢	26¢	25¢	24¢	23¢,	25&10&10%
Saranac.....	23¢	21¢	20¢	19¢	18¢,	30&10%
Champion ...	25¢	23¢	22¢	21¢	20¢,	10&10&10%
Capewell.....	28¢	26¢	25¢	24¢	23¢,	35&5@35&10%
Star.....	23¢	21¢	20¢	19¢	18¢,	10&10@10&12½%
Anchor.....	23¢	21¢	20¢	19¢	18¢,	35%
Western.....	23¢	21¢	20¢	19¢	18¢,	40&10%
Empire Bronzed.....						14 ₩ ℔.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Viles' Patent.....40%

Nail Pullers.—See Pullers, Nail.
Nail Sets.—See Sets, Nail.
Nut Crackers.—See Crackers, Nut.
Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed.....	5.25¢	5.95¢ off list.
Cold Punched.....	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₩ ℔. net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—
Best or Government.... ₩ ℔ 7@7½¢
U. S. Navy..... ₩ ℔ 6@6½¢
Navy..... ₩ ℔ 5½@6¢

Oilers—
Zinc and Tin .....65&10@70&5%
Brass and Copper .....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper 50%
Broughton's Zinc.....60%
Broughton's Brass 50%
Gem, P. D. & Co. ..... ₩ gro. $3
Steel, Draper and Williams.....50%

Openers, Can.
Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₩ doz $2.75, 20%
No. 4 French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $1.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50.....40%
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....50&5%
Domestic, ₩ doz $2.50.....45%
Champion ₩ doz $2.00.....50%

Packing, Steam—
Rubber—
Standard.....60&5@65%
Extra .....50@50&5%
N. Y. B. & P. Co., Standard.....60%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard. ₩ ℔ 80¢,...25@25&5%
Miscellaneous—
American Packing.....10¢@11¢ ₩ ℔
Russia Packing .....14¢ ₩ ℔
Italian Packing .....13¢@14¢ ₩ ℔
Cotton Packing .....15¢@17¢ ₩ ℔
Jute.. .....7¢@8¢

Pails.
Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75
Heiwig's.....	2.50	2.75	3.00
Sidney Shepard & Co.....	2.25	2.25	3.00
Iron Clad	2.50	2.75	3.00
Fire Buckets.....	2.75	2.95	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—35%
Star Pails, 12 qt ..... ₩ doz $5.40
Stable and Milk, 14 qt..... ₩ doz 76.00
Fire Pails, deep..... ₩ doz 5.40
" round bottom....₩ doz $7.80
Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails.....	6.00	6.50
Horse Pails	5.00	
Buggy Pails.....	4.00	
Slop Jars (bal. trap).....	8.00	9.00
Chamber Pails, 14-qt.....	6.50	7.50

Pans.
Dripping.
Smalls sizes..... ₩ ℔ 6¼¢
Large sizes..... ₩ ℔ 5½¢
Silver & Co. (Covered)..... 40%
Fry—
Standard List:

No.....	0	1	2	3	4
₩ doz..	$2.00	$3.75	$4.25	$4.75	$5.25
No.....	5	6	7	8	
₩ doz.....	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans ..... 60&10%
Dust—
Steel Edge, No. 1.....₩ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.
Apple.
Advance..... ₩ doz $4.75
Baldwin..... ₩ doz 5.25
Bonanza..... each 5.00
Daisy..... ₩ doz 4.00
Dandy..... each 7.50
Eclipse..... ₩ doz 4.25
Eureka, 1888..... each 16.00
Family Bay State..... ₩ doz 12.00
Favorite ..... ₩ doz 5.00
Gold Medal..... ₩ doz 4.00
Ideal..... ₩ doz 4.00
Improved Bay State..₩ doz 27.00 @ 30.00
Little Star..... ₩ doz 4.50
Monarch..... ₩ doz 13.50
New Lightning..... ₩ doz 5.50
Oriole..... ₩ doz 4.00
Penn..... ₩ doz 4.00
Perfection..... ₩ doz 4.00
Pomona..... ₩ doz 4.00
Rocking Table..... ₩ doz 6.00
Turn Table.. ..... ₩ doz 4.50
Victor..... ₩ doz 13.50
Waverly..... ₩ doz 4.00
White Mountain..... ₩ doz 4.00
78..... ₩ doz. 4.25
78..... ₩ doz. 7.00
Potato—
White Mountain ..... ₩ doz $4.50
Antrim Combination..... ₩ doz $5.50
Hoosier ..... ₩ doz $13.50
Saratoga..... ₩ doz $5.50

Pencils—
Faber's Carpenters'..... high list 50%
Faber's Round Gilt..... ₩ gro $5.25
Dixon's Lead..... ₩ gro $4.50
Dixon's Lumber..... ₩ gro $6.75
Dixon's Carpenters' 10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Bow—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W Co... 50&10&50&10&5%
Curtain—
Silvered Glass.....net
White Enamel.....net
Escutcheon,
Iron, list Nov. 11, 1885...50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.

1¼ and under, Plain	57½@60%
1¼ and under, Galvanized.....	47½&50%
1¼ and over, Plain.....	67½@70%
1¼ and over, Galvanized.....	55&7½%

Boiler Tubes,

Sizes up to 2¾ in. inclusive.....	55%
Sizes 3 in. and larger.....	65%
Casing.....	55%
Inserted Joints Casing.....	50%
Steel Boiler Tubes.....	30%

Planes and Plane Irons—
Wood Planes—
Molding..... 40&10%
Bench, First Quality..... 50&10%
Bench, Second Quality..... 55&10%
Bailey's (Stanley R. & L. Co.). .. 50&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10%
Steer's Iron Planes..... 35@35&10%
Meriden Mal. Iron Co.'s..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co..... 50@50&10%
Gage Tool Co.'s Self-Setting....30&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co..... 50@50&5%
Plane Irons—
Butcher's..... $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle.....
Ohio..... } ...30&10%
Sandusky.....
S. & I. J. White..... 25%
Stanley R. & L. Co ..... 50&10%

Plates.
Feltoe ..... ₩ ℔ 64@65¢

Pliers.
Button's Patent..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₩ doz .....30&10@33½&5%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant..... 40%
Gas Pliers. 60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel..... 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters..... 30%
Morrill's Parallel, ₩ doz. $13.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 50&10@60%
Cronk's Button Pa tern..... 50&10@60%
Cronk's Carrier Pli rs..... 60@60&5%

Plumbs and Levels—
Regular List . ...75&10@75&10&5%
Stanley's Duplex .....30&10%
Stanley's Handy..... 20&10%
Disston's..... 50%
Pocket Levels..... 70&10@70&10&10%
Davis Iron Levels..... 30%
Davis' Inclinometers ..... 10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00..... 35%
Silver & Co., 6-Ring..₩ doz $4; 3-Ring $2
Poke, Animal—
Bishop's I. X. L.....₩ doz $6.00
Bishop's O. K..... ₩ doz $5.25
Bishop's Pioneer..... ₩ doz $3.75
Bishop's American..... ₩ doz $2.75
Eagle, Double Stale..... ₩ doz $5.75
Eagle, Single Stale..... ₩ doz $3.75
Buckeye, Single Stale..... ₩ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $35.00 ₩ doz 10%
Tower's..... 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₩ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₩ doz $72.00; Nickeled, $84.00..... 25%
J. P. Lovell's Police Goods..... 25%

Polish, Metal.
Prestoline..... 30%
Prestoline Paste..... 33⅓%
Gaston's Silver Compound..... 33⅓%

Polish, Stove.
Joseph Dixon's..... ₩ gro $6.00, 10%
Gem..... ₩ gro $4.50, 10%
Gold Medal..... ₩ gro $6.00, 25%
Mirror ..... ₩ pro $6.00, —%
Lustro ..... ₩ gro $4.75
Ruby..... ₩ gro $3.75
Rising Sun, 5 gro lots ..... ₩ gro $5.50
Dixon's Plumbago..... ₩ ℔ 8¢
Boynton's Noon Day, ₩ gro 13.00
Parlor Pride Stove Enamel..₩ gro
Yates' Liquid, 2 3 5 10 gal.... ₩ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 13½¢
Jet Black ..... ₩ gro $3.50
Japanese..... ₩ gro $3.50
Fireside..... ₩ gro $3.50
Diamond O. K. Enamel..₩ gro $12.00
Bonnell's Liquid Stove Polish..₩ gro $9.00
Bonnell's Paste Stove Polish..₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 13½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 13½¢
Nickel Plate Paste ..... ₩ gro $6.00
Crown Paste..... ₩ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₩ ℔ 12¢
Black Flag..... ₩ gross, $7.20
Black Flag, 5 and 10 ℔ pails.... ₩ ℔, 12¢
Black Flag, liquid, in bottles, ₩ gro..$8.00
Diamond Rock Nickel Cleaner..₩ gro $10.20

Poppers, Corn—
Round or Square, 1 qt..₩ gr $10.00@10.50
Round or Square, 1½ qt..₩ gr $15@15.50
Round or Square, 2 qt..₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned..... 40&10@40&10&5%
Enameled..... 40&10@40&10&5%
Family, Howe's "Eureka" 40%
Family, L. F. C.'s "Handy" 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co..... 20&10@30%
Henis..... ₩ doz $3.50
Shepard's "Queen City 40%
Silver & Co..... ₩ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton..... ₩ doz $13.00, 33⅓%
Curtiss Hammer..... ₩ doz $9.00
Giant, No. 1..... ₩ doz. $13.00, 10%
Giant, No. 2..... ₩ doz, $15.00, 10%
Pelican..... ₩ doz, $9.00, 25%
Eclipse..... each, $3.00 net

Pulleys—
Hot House, Awning, &c..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side..... 60%&10%
Japanned Clothes Line..... 60&10%
Empire Sash Pulley..... 55@60%
Moore's Sash, Anti-Friction..... 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "T" Common and Pat. Rushed 30%
Hay Fork, Tarbox Pat. Iron..... 30%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₩ doz $12.00..... 40%

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—
Saddlers' or Drive, good, ₩ doz....60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality.... ₩ doz $2.50@2.66
Spring, Leach's Pat..... 15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners', P. S. & W. Co., ₩ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&2%
Rice Hand Punches 15%
Avery's Revolving..... 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door. Wr't Brass, ₩ ℔ 35¢..... 15%
Sliding Door, Bronzed Wr't Iron..₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door. Light. In. ¾ ⅞ 1
Per 100 feet.... .....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 net ...$2.15 2.70 3.25 net
Terry's Steel Rail, ₩ foot..... 4½¢
Victor Track Rail, 7¢ ₩ foot..... 50&5%
Carrier, double braced, Steel Rail, ₩ foot ..... 4@4½¢
Moore's Wrought Iron..... 30%

Rakes—
Cast Steel, Association goods...60%@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable..... 70@70&5%
Gibbs Lawn Rake..... ₩ doz $4.50
Canton Lawn Rake..... ₩ doz $3.75
Favorite Lawn Rake..... ₩ doz $4.40
Ft. Madison Prize Bow Brace and Peerless 30%
Fort Madison Steel Tooth Lawn Rake, $6.00..... 35%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10 to $..10%
Jordan's AAAI, new list..... net
Jordan's Old Faithful, new list..... net
Galvanic..... ₩ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co..... 35%
Sargent's..... 60%&10@70&5%
Hotchkiss' low list..... 20%
Humason, Beckley & Co.'s..... 70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Elirich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers..... ₩ doz $2.00
Top of the Hill Rings..... ₩ doz $1.25
Hill's Improved Ringers..... ₩ doz $1.25
Hill's Old Style Ringers..... ₩ doz $1.10½
Hill's Tongs..... ₩ doz $2.00
Hill's Rings..... ₩ doz bxs $1.00
Perfect Rings..... ₩ doz bxs $1.50
Perfect Ringers..... ₩ doz $2.15@$2.25
Blair's Hog Ringers..... ₩ doz $2.00
Blair's Hog Rings..... ₩ doz 90¢@$1.00
Champion Ringers..... ₩ doz $2.00
Champion Rings, Double..... ₩ doz $2.25
Brown's Ringers..... ₩ doz $2.00
Brown's Rings..... ₩ doz $1.15@1.25
Electric Hog Rings.... ₩ doz boxes $1.50
Electric Hog Ringers ..... ₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87..... 40%
Copper..... 60&10@60&10&5%
Coppered Iron, Bettina Brand..... 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass ..... 35&2½%
Stair, Black Walnut ..... ₩ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction..... 55%
Union Barn Door Roller 70%

Rope.
Manila, 7-16 in. diam. and larger ₩ ℔ 12½¢
Manila..... ⅜ in. ₩ ℔ 12½¢
Manila..... ¼ and 5-16 in. ₩ ℔ 13½¢
Manila Tarred Rope..... ₩ ℔ 11½¢
Manila, Hay Rope..... ₩ ℔ 12½¢
Sisal....⅜-7-16 inch and larger ₩ ℔ 10½¢
Sisal..... ⅜ in. ₩ ℔ 10½¢
Sisal..... ¼ and 5-16 in. ₩ ℔ 11½¢
Sisal, Hay Rope..... ₩ ℔ 10½¢
Sisal, Tarred Rope..... ₩ ℔ 9½¢
Sisal, Medium Lath Yarn..... ₩ ℔ 9½¢
New Zealand..⅜-16 in. & larger ₩ ℔ 8½¢
New Zealand..... ¼ inch, ₩ ℔ 9½¢
New Zealand..¼ and 5-16 inch, ₩ ℔ 9½¢
New Zealand, Hay Rope... ₩ ℔ 8½¢
New Zealand, Tarred Rope....₩ ℔ 8½¢
Note.—Manufacturers' prices on above 1¢ ₩ ℔ less, f. o. b. factory—less 1½% for cash.
Cotton Rope..... ₩ ℔ 13½@16¢
Jute Rope..... ₩ ℔ 6½@7¢
Wire—
List February, 1892.
A 1 kinds 45%

Rules—
Boxwood ..... 80&10&10%
Ivory..... 50@50&10%
Starrett's Rules and Straight Edges, Steel..... 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws— The following prices are often cut by jobbers.
Disston's Circular ..... 45@45&5%
Disston's Cross Cuts..... 45@45&5%
Disston's Hand..... 20@20&5%
Woodrough & McParlin, Hand, Panel and Rip..... 25@25&5%
Narrow Champion Cross Cuts with Handles, ₩ foot..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot..... 20@22¢
Champion Extra Thin Back Cross Cuts, ₩ foot..... 29@31¢
One Man Champion Cross Cuts, ₩ foot..... 37@40
Wheeler, Madden & Clemson Mfg. Co. Hand, Panel and Rip..... 3@3&5%
Narrow Champion Cross Cuts with Handles, ₩ foot..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot..... 20@22¢
Champion Extra Thin Back Cross Cuts, ₩ foot..... 29@31¢
One Man Champion Cross Cuts, ₩ ft.. 37@40
Atkins' Circular Shingle and Heading 50%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 32¢
Atkins' Champion and Electric Tooth X Cuts..... ₩ foot 20¢
Atkins' Hollow Back X Cuts. ₩ foot 20¢
Atkins' Mulay, Mill and Drag..... 40%
Atkins' One-Man Saw, with handles, ₩ foot 40¢
Peace Circular and Mill..... 45@45&5%
Peace Hand Panel and Rip.... 25@25&5%
Peace Cross Cuts..... 45@45&5%
Richardson's Circular and Mill. 45@45&5%
Richardson's ⅄ Cuts..... 45@45&5%
Richardson's Hand, &c..... 25@25&5%
C. E. Jennings & Co., Hand, Panel and Rip ..... 25@25&10%

Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cab. Makers' $15.25%
Barnes' Scroll Saw Blades.....25%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Richie Bros.' Platform.....40%

Scale Beams—See Beams, Scale.

Scissors. Fluting.....45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00, 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....30&10%
Foot.....50&10@60%
Ship, Common .....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $3.38
Bench, Wood, Hickory.....30&10%
Hand, Wood.....35&10@35&10&2%
Hand, Grand Rapids, list.....55%
Lag, Blunt Point, list Jan. 1, 1890. 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75@75&10%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & F. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&2%
Jack Screws Stearns'.....40@40&10%

Cork—
Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&2½%
Howe Bros & Hulbert.....30%

Machine—
Flat Head, Iron.....55%
Round Head, Iron 50%

Wood—
List January 1, 1891.
Flat Head Iron.....70 %
Round Head Iron.....65 %
Flat Head Brass.....70 %
Round Head Brass.....65 %
Flat Head Bronze.....70 %
Round Head Bronze.....65 %
Rowers' Drive Screws.....82½%
Extra 10 & 10&5 % off on lots given.

Scroll Saws—See Saws, Scroll.

Scythes.
Grain.....40&5@40&10%
Grass.....40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.

Awl and Tool.
Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....35@35&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18.....25%
Henry's Combination Hafts...₱ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $3.50.....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—
Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₱ gr.,$12, 20%

Rivet,
Regular list.....50&10%

Saw—
Stillman's Genuine...₱ doz $5.00@7.75.
Stillman's Pattern Hand, ₱ doz $3.25; Cross Cut, 5.25.....40@5%
Common Lever .....₱ doz $2.00, 45@50%
Morrill's No. 1, $15.00; Nos. 2&4, $24.00.....40&10@50%
Leach's. .No. 0, $8.00; No. 1, $15, 15@20%
Nash's .....30&10@30&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. .....30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine.....$13.00, 50&10@60%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star. 25%
Leopold.....25%
Atkin's Lever.....40&10@50%
Atkin's Criterion.....₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Chieftain Co.'s Superior.....₱ doz $7.00
Chieftain Co.'s Royal.....₱ doz $7.50
Crescent.....₱ doz $3.00

Sharpeners. Knife.
Parkins.
Applewood Handles....₱ doz $6.00, 40%
Rosewood or Cocobo s. ₱ doz $900 40%

Shaves, Spoke
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's, ₱ doz $5.00.....35%

Shears—
American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....30&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers; First quality.....30@30&10% Second quality.....30&10@30&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Davenport Cutlery Co.....60@60&10%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic, 3¼ to 9 in, ₱ doz, $1.00 ₱ inch

Pruning Shears and Hooks.
Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 30&10%
Disston's Pruning Hook, ₱ doz $12.00, 30&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00
Henry's Pruning Shears, ₱ doz $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 20%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co.....60%

Tinners', &c.—
Shears and Snips (P. S. & W.).....30@35%
Snips, J. Mallinson & Co.....35⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@50&5%
R. & E., list Dec. 15, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 15, 1885.....60&2%
Moore's Anti-Friction.....50%

Sliding Shutter—
R. & E. list Dec. 15, 1885.....60&10&2%
Sargent's list.....50&10%
Reading list.....60&10&10%

Shells—
First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands. 33⅓&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax. 65&2%

Shells Loaded—
Standard List, July 12, 1890.....40&10&10@40&10&10&5%

Ship Tools—
L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix and Bryden's Boss, at factory.....$4.00
Bryden's Frog Pressure, at factory.$5.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ₤ 9¢
1000 ₤ lots.....₱ ₤ 9½¢
500 ₤ lots.....₱ ₤ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-₤ bag	$1.30	$1.35
Drop, up to B, 5-₤ bag	.35	.35
Drop, B and larger, 25-₱ bag	1.55	1.60
Drop, B and larger 5-₤ bag	.40	.40
Buck and Chilled, 25-₤ bag	1.55	1.60
Buck and Chilled, 5-₤ bag	.40	.40
Dust Shot, 25-₤ bag	1.95	2.00
Dust Shot, 5-₤ bag	.45	.45

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....30%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30 %
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Sieves—
Mann's Tin Rim.....50&25%
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₱ doz $2.00; ₱ gr $21.60
Electric.....₱ gr $21.00
A. & W. Sifters.....₱ doz 2.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co.....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Slates—
School, by case.....50&10@50&10&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&3%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&3%
Covered Spring.....60&10&10%
E. Covert's Triumph.....33⅓%

Snaths, Scythe.
List.....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8½-inch, ₱ dos., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co... .....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bro.....40&15%
Reed & Barton.....40@40&15%
Wm. Rogers Mfg. Co.....40, 15&2%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal.....50, 10&5%
184 Rogers' German Silver.....60&5%
228 Rogers' Nickel Silver.....50&5%
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891.....60&7½&2½%
Boardman's Britannia Spoons, case lots.....60&5% cash

Springs—
Door.—
Torrey's Rod, 30 in.....₱ dos $1.20@1.25
Gray's, ₱ gr., $20.00.....25%
Bee Rod ₱ gr., $20.00.....20@25%
Warner's No. 1, ₱ doz, $2.80; No. 2, $3.20.....50@50&5%
Gem (Coil), list April 19, 1886.....10@15%
Star (Coil), list April 19, 1886...20@20&5%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50@50&10%
Rubber, complete, ₱ dos, $4.50...55&10%
Hercules.....50@50&10%

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....
Nickel-Plated.....} .80&10@80&10&10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor 50%

Squeezers.
Fodder.—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Lemon—
Porcelain Lined, No. 1....₱ doz $6.00, 35&20%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved .....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $8.25; 3, $1.00; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Silver & Co., Glass.....₱ gro. $9.00
Manny Lemon Juice Extractor: Standard.....₱ doz $0.75@$1.00 Improved.....₱ doz $4.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.
Blind—
Barbed, ½ in. and larger.....₱ ₤ 7@7½¢
Barbed, ¼ in.....₱ ₤ 8@8½¢
Fence staples, Galvanized. } Same price as B'rb'd Wire.
Fence Staples, Plain..... } See Trd. Rep.

Steelyards... .....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....33⅓&40%
Butterfield's Goods.....33⅓&40%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates.....33⅓&40%
Reversible Ratchet.....30
Gardner.....35%

Stops, Bench.
Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25@10&10%
McGill's.....₱ doz $3.....10%
Cincinnati.....35&10%
Terrell's Nos. 1 and 2, ₱ doz., $3; No. 3, $3.60.....30%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ₤ 2½¢
Washita Stone, Extra.....₱ ₤ 22@30¢
Washita Stone, No. 1.....₱ ₤ 19@20¢
Washita Stone, No. 2.....₱ ₤ 13@13¢
Washita Slips, No. 1, Extra..₱ ₤ 44@45¢
Washita Slips, No. 1.....₱ ₤ 33@34¢
Arkansas Stone, No. 1, 4 to 6 in.₱ ₤ $1.50
Arkansas Stone, No. 1, 6 to 9 in.₱ ₤ $1.75
Turkey Oil Stone, 4 to 8 in.....₱ ₤ 40¢
Turkey Slips.....₱ ₤ $1.00@$1.25
Lake Superior, Chase.....₱ ₤ 12¢
Lake Superior Slips, Chase.....₱ ₤ 20¢
Seneca Stone, Red Paper Brand...₱ ₤ 18@20¢
Seneca Stone, High Rounds..₱ ₤ 20@25¢
Seneca Stone, Small Wheels..₱ gro $14.00

Stove Polish—See Polish, Stove.

Stretchers. Carpet.
Cast Steel, Polished.....₱ dos $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Gullard's.....35@35&10%

Strops, Razor—
Genuine Emerson.....60@60&10%
Imitation " ....₱ doz $2.00, 20&10&5%
Torrey's.....30%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric.....List net

Stuffers or Fillers, Sausage—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry .....₱ dos, No. 1, $15.00; No. 0, $21.00.....50@50&5@50&10%
Draw Cut No. 4, each $30.00.....30%
Enterprise Mfg. Co.....50@50&10%
Silver's.....40&10%

Sweepers, Carpet.
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $30.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $16.00; No. 3, $30.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior .....₱ doz $22.00
Garland .....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King .....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Ladies' Friend.....₱ doz $15.00
Advance.....₱ doz $18.00
Supreme.....₱ doz $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....75 %
American, Tin'd and Cop'd.77½ %
Steel, Bright and Blued...72½ %
Steel, Tinned and Coppered 75 %
Swedes Iron, Blued. .....72½ %
Swedes Iron, Tinned.....75 %
American Iron Tacks.....72½ %
Swedes Iron Tacks—
S. S., Blued.....75 %
S. S., Tinned.....77½ %
Lanc., Blued.....66⅔ %
Lanc., Tinned.....72½ %
Gimp and Lace Tacks—
S. S., Blued.....75 %
S. S., Tinned.....77½ %
Lanc., Blued.....66⅔ %
Lanc., Tinned.....72½ %
Basket and Trimmers' Tacks—
Lanc.....66⅔ %
S. S.....70 %
Hungarian Nails.....60% %
Miners' Tacks, S. S.....75 %
Miners' Tacks, Lanc.....70 %
Common and Patent Brads..66⅔ %
Leathered Tacks.....20 %
Brush Tacks.....50 %
Looking Glass Tacks.....50 %
Picture-Frame Points.....50 %
Finishing Nails.....66⅔ %
Trunk and Clout Nails—
Black.....65 %
Tinned or Coppered.....66⅔ %
Basket Nails .....62½ %
Chair Nails.....62½ %
Cigar-Box Nails .....50 %
Tin Capped Nails.....50 %

Regular discount 10&2 %, cash. 10&10&10 % is often given. On many of these goods extra

Miscellaneous—
D'ble-Point..120 count55&10@55&10&10%
Double Point, 100 count.....90%
Wire Carpet Nails.....50&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, R. & S. Mfg. Co.'s list.....50&10%

Tapes, Measuring—
American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....35@30%

Thermometers—
Tin Case.....30@30&10%

Thimble Skeins—See Skeins.

Ties, Bale—See Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears Tinners', &c

Tinware—
Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&25%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....20%
Barton's.....30@30&5%
L. & J. White.....25%
Albertson Mfg. Co.....30%
Beatty's.....30@30&5%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Lumber.
Ring Peavies, "Blue Line"...₩ dos $20.00
Ring Peavies, Common.....₩ dos $18.00
Steel Socket Peavies.....₩ dos $21.00
Mall. Iron Socket Peavies....₩ dos $19.00
Cant Hooks, "Blue Line"..₩ dos $16.00
Cant Hooks, Common Finish..₩ dos $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ dos $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ dos $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ dos $12.00
Hand Spikes....₩ dos 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ dos., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ dos, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ dos. 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ dos, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ dos $13.00

Saw.
Atkins' Perfection.....₩ dos $12.00
Atkins' Excelsior.....₩ dos $6.00
Atkins' Giant.....₩ dos $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40@10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ dos holes, 9@10¢
Mouse, Round Wire.....₩ dos $1.50 10%
Mouse, Cage, Wire.....₩ dos $2.50, 10%
Mouse, Catch-'em-alive.....₩ ds $2.50 15%
Mouse, Bonanza.....₩ dos $0.90 @$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ dos.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ dos $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ dos. 55&10%
Douglas'.....₩ dos $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering, 20&10&5&25%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	25¢	31¢
No. 12, ¼ and ½ ℔ Balls	22¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	29¢
No. 24, ¼ and ½ ℔ Balls	20¢	29¢
No. 36, ¼ and ½ ℔ Balls	18¢	28¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.53@54¢
Chalk Line, Cotton, ½ ℔ Balls.....35¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....15½¢
2-Ply Hemp, 1 ℔ Balls.....16@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@15¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6½¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to dos..18¢

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60@10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20 @ 25 %
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%&10%
Hopkins'.....₩ dos $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.& W.R.A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up...	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R. A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....$1.70@$1.75	
Eley's P. E., 11@10..... 3.00@ 3.25	

Dis. 20&2½

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....75@75&5%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.
Indurated Fiber—35%
Spittoons, No. 2, ₩ dos.....$3.40
Hasins, Ringed, ₩ dos., No. 2.....$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$1.60
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5%

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1⅜
Washers.....	6	5	3.50¢	3

In lots less than 200 ℔, ₩ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.25; 10 in., $2.70; 12 in., $3.38

Wire and Wire Goods—
Iron—
Market.
Br. & Ann., Nos. 0 to 18.....80%
Cop'd, Nos. 0 to 18.....77½%
Galv., Nos. 0 to 18.....70@70&10%
Tin'd, Tin'd list Nos. 0 to 18.70@70&10%
Stone,
Br. and Ann'd, Nos. 16 to 18.....80%
Bright and Ann'd, Nos. 19 to 26..80&5%
Br. and Ann'd, Nos. 27 to 36...82½&5%
Tinned.....
Tinned Broom Wire .18 to 21, ₩ ℔...45¢
Galvanized Fence, Nos. 8 and 9..70&10%
Brass, list Jan. 18, 1884... .....40%
Copper, list Jan. 18, 1884.....40%
Annealed Wire on Spools.....60%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....50%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire .....$6.00 to $, 30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—
Standard list.....85%

Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire, Barb.—Prices unsettled. See Trade Report.

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S" .....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&3%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural.... } 75&10@
Girard Agricultural..... } 70&10&5%
Lamson & Sessions' Agric'l..
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....35%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$5.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....20&10%
Always Ready.....35&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&3%
Acme, Nickeled.....40&3%
Hercules.....70%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, 91..2% cash
Colby Wringer Co., list Sept. 1'91.2% cash
Lovell Mfg Co., list Jan. 1, 1892.2 % cash
Peerless Mfg. Co, list Feb., 1892..2%cash

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 85@85&c.

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	37	@	..
Linseed, City, boiled.....	40	@	..
Linseed, Western, raw.....	35	@	36
Lard, City, Extra Winter..	57	@	58
Lard, City, Prime.....	..	@	57
Lard, City, Extra No. 1.....	44	@	45
Lard, City, No. 1.....	40	@	42
Lard, Western, prime.....	..	@	56
Cotton-seed, Crude, prime.	25	@	25½
Cotton-seed, Crude, off grades.....	22½@		23½
Cotton-seed, Summer Yellow, prime.....	29	@	29½
Cotton-seed, Summer Yellow, off grades.....	27½@		28½
Sperm, Crude.....	70	@	71
Sperm, Natural Spring.....	67	@	70
Sperm, Bleached Spring....	72	@	75
Sperm, Natural Winter.....	73	@	76
Sperm, Bleached Winter...	78	@	81
Whale, Crude.....	..	@	45
Whale, Natural Winter.....	54	@	55
Whale, Bleached Winter....	57	@	58
Whale, Extra Bleached.....	59	@	60
Sea Elephant, Bleached Winter.....	62	@	63
Menhaden, Crude, Sound...	30	@	32
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	37	@	38
Menhaden, Bleached W'ter.	38	@	39
Menhaden, Extra Bleached	40	@	42
Tallow, City, prime.....	44	@	45
Tallow, Western, prime....	42½@		43
Cocoanut, Ceylon.....	5½@		5¾
Cocoanut, Cochin.....	6½@		6¾
Cod, Domestic	38	@	40
Cod, Foreign.....	42	@	44
Red Elaine	34	@	36
Red Saponified..... ₩ ℔	4½@		5
Sank.....per gal	35	@	36
Straits.....	36	@	37
Olive, Italian, bbls.....	60	@	63
Neatsfoot, prime	55	@	65
Palm, prime, Lagos....₩ ℔	6	@	6¾

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	7	@	7½
Black, 29 gravity, 15 cold test.....	8	@	8½
Black, 29 gravity, summer.	6	@	6½
Cylinder light filtered.....	15	@	
Cylinder, dark, filtered	12	@	15
Paraffine, 23½ @ 24 gravity.	13½@		14
Paraffine, 25 gravity.....	12½@		13
Paraffine, 28 gravity.....	8	@	9½
Paraffine, red, 23½@24 gr'ty	13	@	15

Paints and Colors.

Barytes, Foreign, ₩ ton.	$22.00	@	24.00
Barytes, Amer. floated...	30.00	@	32.00
Barytes, Amer. No. 1....	19.00	@	20.00
Barytes, Amer. No. 2.....	13.00	@	16.00
Barytes, Amer., No. 3....	11.00	@	12.00
Blue, Celestial..... ₩ ℔	6	@	8
Blue, Chinese	40	@	50
Blue Prussian.....	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	
Carmine, No. 40, in ounce bottles.....	4.20	@	
Chalk, in bulk.... ₩ ton.	2.00	@	.05
Chalk, in bbls.. ₩ 100 ℔.	33	@	40
China Clay, English.... ₩ ton.	13.00	@	18.00
Cobalt Oxide, prep'd....	9.00	@	11.00
Cobalt Oxide, black..... lots 100 ℔.	2.50	@	....
Cobalt, Oxide, black..... less 100 ℔.	2.65	@	2.90
Green, Paris, in bulk....	14	@	15½
Green Paris, 170 @ 175 ℔ kegs.....	14½@		15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	6	@	12
Green, Chrome, pure....	23	@	25
Lead, Eng., B.B. white....	9½@		10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔....	7¼	@	7½
Kegs, lots 500 ℔ to 5 tons....	6¾	@	7
Kegs, lots 5 tons to 12 tons..	6¾	@	6¾
Kegs, lots 12 tons and over..	6¼	@	6¾
Lead White in oil 25 ℔ tin pails add to keg price.....		@	¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price....		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2¼
Lead, Red, bbls. and ½ bbls....	6¾	@	7¼
Lead Red, kegs.....	6¾	@	7¼
Litharge, kegs.....	6½	@	7½
Litharge, bbls. and ½ bbls.....	6¾	@	7¾

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed.....	1½@		2½
Ocher, German Washed...	1½@		3
Ocher, American.....	½@		1½
Orange Mineral, English...	8½@		9
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	8½@		09
Orange Mineral, American.	8	@	8½
Paris White, English Cliff-stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½@		7
Red, Indian, American.....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.25
Red, Venetian, English....	1.00	@	1.50
Sienna, Italian, Burnt and Powd. ₩ ℔	4	@	5
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd..	4½@		5½
Sienna, Ital., Raw Lumps..	1½@		2½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1¼
Terra Alba, Fr'ch. ₩ 100 ℔	75	@	80
Terra Alba, English	80	@	90
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Bnt. and Powd., ₩ ℔	3½@		4
Umber, Turkey Bnt. in	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	25
Vermilion Americ. Lead..	11½@		12
Vermilion, Quicks'er, bulk.	60	@	62
Vermilion, Quicks'er, bags.	61	@	63
Vermilion Quicksilver, smaller pkgs.....	65	@	67
Vermilion English Imcort	85	@	90
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste...	90	@	92½
Vermilion, Chinese.....	92½@		95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'.....	55	@	65
Zinc, American, dry... ₩ ℔	4½@		5
Zinc, French, Red Seal....	..	@	8½
Zinc, French, Green Seal..	..	@	8½
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal...	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O....	..	@	6½
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10½@		11½
lots less than 1 ton	11	@	11½
Zinc, V. M. in Poppy Oil, Red Seal.....	..	@	..
lots of 1 ton and over....	10	@	10½
Lots of less than 1 ton....	10½@		10¾

Discounts.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Black, Drop, Frankfort	25	@	30
Black, Drop, English.....	12	@	15
Black, Drop, Domestic	7	@	10
Black, Lampblack, Best....	20	@	35
Black, Lampblack, Common	7	@	18
Black, Ivory.....	8	@	15
Blue, Chinese.....	38	@	40
Blue, Prussian.....	29	@	45
Blue, Ultramar.ine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ⅛ bbls....	.01¾@		.01¾
In tubs.....	.01¾@		.01¾
In tin cans.....	.01¾@		.02¼
In bladders.....	.01¾@		.02¼

Spirits Turpentine.

In regular bbls.....	42½@		43
In machine bbls.....	43	@	43½

Glue.

Low Grade.....₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15

CURRENT METAL PRICES.

MARCH 2, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square.. 1 to 6 in. x ⅝ to 1 in...	₩ lb 1.90 @ 2.00¢
Refined Iron:	
¾ to 2 in. round and square. 1 to 4 in. x ⅜ to 1½ in.... 4½ to 6 in. x ⅜ to 1 in.	₩ lb 2.00 @ 2.20¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.40¢
Rods—⅝ and 11-16 round and sq.	₩ lb 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.30 @ 2.50¢
"Burden Best" Iron, base price.	₩ lb 3.00¢
Burden's "H. B. & S." Iron, base price	₩ lb 2.80¢
"Ulster"	₩ lb 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

	Black. Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb 3 @	3⅝¢
17 to 20	₩ lb 3⅛ @	3⅝¢
21 to 24	₩ lb 3¼ @	3⅝¢
25 and 26	₩ lb 3⅜ @	3¾¢
27	₩ lb 3½ @	3⅞¢
28	₩ lb 3⅝ @	4 ¢
American B. B¥	₩ lb 4¢ @ 4½¢	

Galvanized Sheet Iron.

	B. B.	2d qual.
Nos. 10 to 16	₩ lb 4.20¢	4 ¢
17 to 22	₩ lb 4.60¢	4.30¢
23 to 24	₩ lb 4.90¢	4.70¢
25 to 26	₩ lb 5.30¢	5 ¢
27	₩ lb 5.60¢	5.30¢
28	₩ lb 6 ¢	5.70¢
29 to 30	₩ lb 7 ¢	6.70¢
Genuine Russia, according to assortment	₩ lb 11½¢ @ 11½¢	
Patent Planished	₩ lb A, 10¢; B, 9¢	
Craig Polished Sheet Steel	₩ lb, 8½¢	

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs	22 @ ..¢
Straits, Pigs	21 @21½¢
Straits in Bars	23 ¢

Tin Plates.

Duty: 2.2 cents per pound.

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade.	IC,	10 x14..	@	$6.50
" " "	IC,	12 x12..	@	6.75
" " "	IC,	14 x20..	@	6.50
" " "	IC,	20 x28..	@	13.00
" " "	IX,	10 x14..	@	8.50
" " "	IX,	12 x12 .	@	8.75
" " "	IX,	14 x20 .	@	8.50
" " "	IX,	20 x28..	@	17.00
" " "	DC,	12½x17..	@	6.00
" " "	DX	12½x17..	@	8.00
Allaway Grade	IC,	10 x14..	@	6.00
" "	IC,	12 x12..	@	6.25
" "	IC,	14 x20..	@	6.00
" "	IC,	20 x28..	@	12.00
" "	IX,	10 x14..	@	7.50
" "	IX,	12 x12..	@	7.75
" "	IX,	14 x20..	@	7.50
" "	IX,	20 x28..	@	15.00
" "	DC,	12½x17.	@	5.50
" "	DX,	12½x17..	@	7.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	$5.70	@ $5.75
10 x 20..	..	@ 8.50
20 x 28..	11.50	@ 12 00
IX, 10 x 14, 14 x 20..	....	@ 7.00
BV Grade.—IC, 10 x 14, 14 x 20..	....	@ 5.75

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Dean Grade.—IC, 14 x 20	....	@ $5.75
20 x 28	....	@ 11.00
IX, 14 x 20	....	@ 6.50
20 x 28	....	@ 13.00
Abecarne Grade.—IC, 14 x 20	.. ..	@ 5 65
20 x 28 ..	10.75	@ 11 00
IX 14 x 20 . ..		@ 6 50
20 x 28 ...	....	@ 13 00

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	@ $13 3⁵
IXX, 14 x 28	112 sheets	@ 14 .0
IXX, 14 x 31	112 sheets	@ 16.00

Copper.

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 11¼¢
Ansonia Grade Arizona	@ 11 ¢
Ansonia Grade Casting	@ 10¾¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	24	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	23	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅝ inch diameter and over, per pound. 22¢

Circles, 60 inches in diameter and less, 2 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

10 % discount.

Copper Wash Bowl Bottoms.

Tinned ₩ lb 34¢, 10%

Tinning.

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ lb
14 oz.	25¢ ₩ lb
12 oz.	27¢ ₩ lb

Seamless Brass Tubes.

Net.

Dec. 16, 1891.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1⅛
8-14	6-12	30	26	23	22	21	20	17
15	13	31	26	24	23	22	21	18
16	14	32	27	25	24	23	22	18
17	15	33	28	26	23	24	23	19
18	16	35	29	27	25	24	23	20
19	17	36	30	28	27	26	25	22
20	18-19	37	32	30	29	28	27	24
21	20	39	34	32	31	30	29	27
22	21	41	35	34	32	31	30	29
23	22	43	37	35	34	33	32	32
24	23	46	39	37	36	34	33	34
25	24	49	42	39	38	37	36	38

Copper Tubes, 3¢ ₩ lb additional.

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	45¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	30 @ ..%

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 / 10	in. 10 / 12	in. 12 / 14	in. 14 / 16	in. 16 / 18	in. 18 / 20	in. 20 / 22	in. 22 / 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.32
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36
Common High Brass: Wider than and including	in. 24 / 26	in. 26 / 28	in. 28 / 30	in. 30 / 32	in. 32 / 34	in. 34 / 36	in. 36 / 38	in. 38 / 40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.66
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.68
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.73

Discount from List 10 % to 25 %.

Brass and Copper Wire.

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0 26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 " " 20	.24	.26	.28	.32
No. 21, or 0.032 diam	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0.26	$0.28	$0.30	$0.34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.58
No. 31	.51	.53	.55	.61
No. 32	.55	.57	.59	.67
No. 33	.59	.61	.63	.73
No. 34	.64	.66	.68	.86
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No. 39	2.00	2.02	2.00	3.25
No. 40	2.60	2.62	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

	Per lb.		Per lb.
No. 5	42¢	No. 11	56¢
No. 6	42¢	No. 12	58¢
No. 7	42¢	No. 13	60¢
No. 8	50¢	No. 14	62¢
No. 9	52¢	No 15	70¢
No 10	54¢		

60 % @ 10 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to ⅜ inch inclusive	17¢ ₩ lb
Over ⅜ to 3½ inches inclusive	16¢ ₩ lb
Over 3½ to 5 inches inclusive	17¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

¼ to ⅜ inch inclusive	18¢ ₩ lb
Over ⅜ to 2 inches inclusive	17¢ ₩ lb
Over 2 to 3½ inches inclusive	18¢ ₩ lb
Over 3½ to 5 inches inclusive	19¢ ₩ lb

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5½¢
Bertha (pure)	5¾¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	7¼¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets 2½¢ ₩ lb.

American Pig	4½¢
Bar	5½¢
Pipe, subject to discount 20 %	6¼¢
Tin-Lined Pipe, subject to discount 20 %	15¢
Block Tin Pipes, subject to discount 20 %	37½¢
Sheet, subject to discount 20 %	7¢

Old Lead in exchange, 3½¢ ₩ lb.

Solder.

½ @ ½ (Guaranteed)	14¢
No. 1	11¼¢
Extra Wiping	11¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 16 @ 1 6½¢
Hallett's	" .... @ 13½¢

ALUMINUM.

Prices Per Ton.

Duty: 15 cents per pound.

Over 98 % pure	₩ lb .75
94 % @ 98 % pure	₩ lb .65

Old Metals.

Prices Paid in New York.

Heavy Copper	₩ lb 10 ¢
Light Copper	₩ lb 9 ¢
Heavy Brass	₩ lb 7 ¢
Light Brass	₩ lb 6 ¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14 ¢
No 2 Pewter	₩ lb 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.00